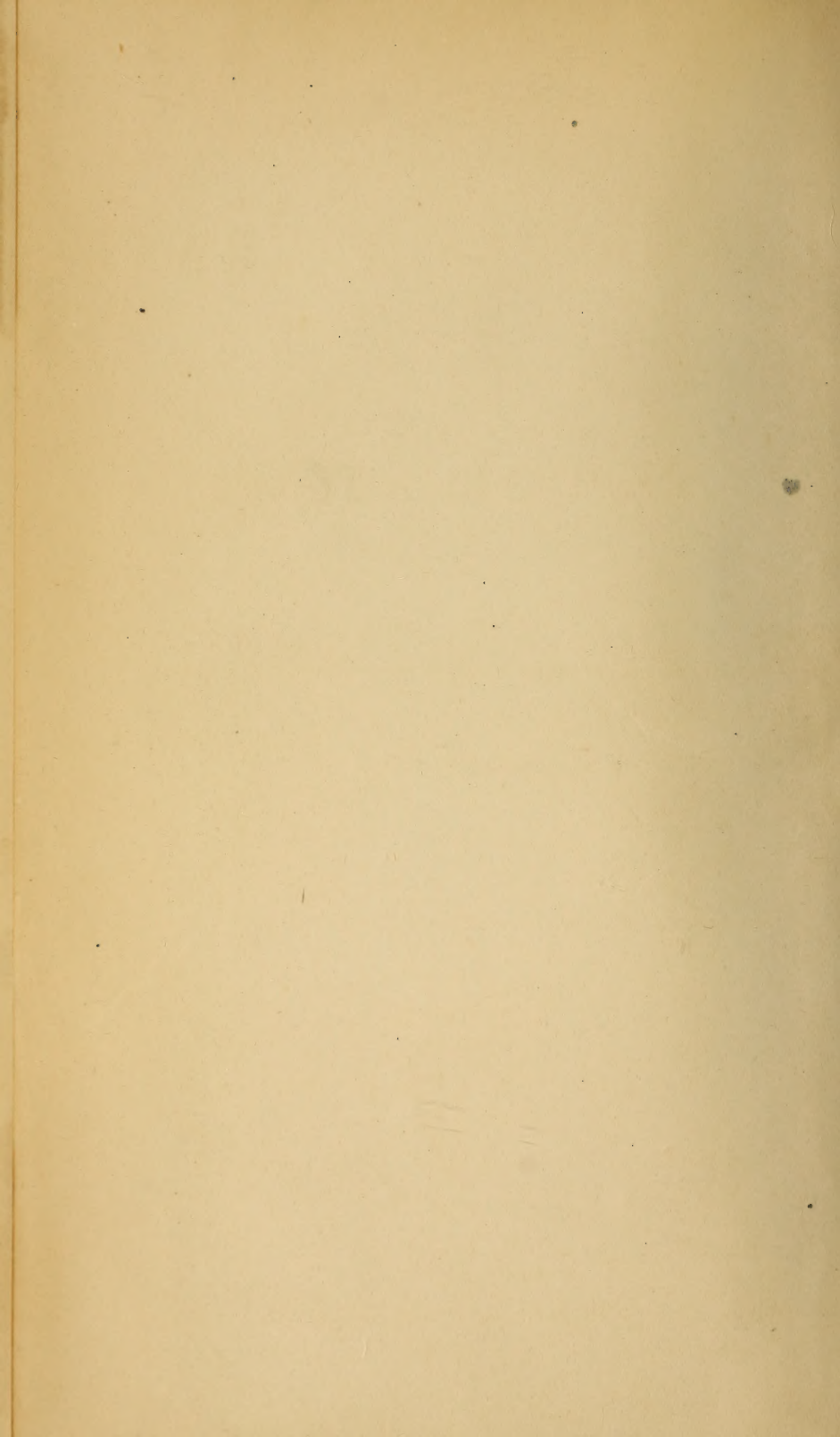






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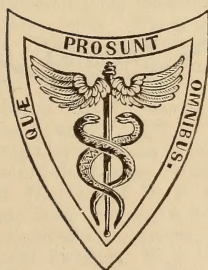
EDITED BY

ISAAC HAYS, M.D.,

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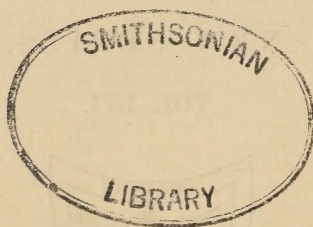


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TO READERS AND CORRESPONDENTS.

WE must repeat our acknowledgments to our numerous correspondents for the liberal supply of interesting papers with which they keep us supplied, and we ask the indulgence of those, the insertion of whose communications has been unavoidably postponed. Sixteen pages have been added to the present number of the Journal, several Bibliographical Notices and a portion of the Domestic Summary omitted, and yet we have been compelled, to our great regret, to postpone the insertion of many valuable original papers. The mere selection of Articles from the numerous interesting ones before us is, as may be supposed, a sufficiently embarrassing task, and this is rendered doubly difficult by weighty considerations, which may not be so apparent to our contributors, but which an editor ought to keep constantly in view in making up the contents of every number of his Journal.

All articles intended for the *Original Department* of this Journal must be communicated to it *exclusively*. As original articles are accepted only on this condition, we consider those who favour us with contributions to be bound in honour to conform to it.

Contributors who wish their articles to appear in the next number, should forward them before the 1st of August.

Compensation is allowed for original articles, and reviews, *except* when illustrations or extra copies are required. A *limited* number of extra copies will be furnished to authors, *if the request for them be made when the communication is sent*.

We received from Dr. J. H. Salisbury, early in April last, a paper containing a description, with figures, of certain algoid growths, which he had discovered in persons affected with variola, vaccinia, and typhoid fever, and which he considers to be the causes of those diseases. The paper, he writes us, was prepared about a year since, and was shown at that time to Dr. Jos. G. Richardson, who, in a letter to us, confirms that statement.

The following works have been received:—

Dictionnaire Annuel des progrès des Sciences et Institutions Médicales suite et complément de tous les Dictionnaires. Par M. P. GARNIER, Méd. de l'asile de Bon-Secours, Rédacteur de l'Union Médicale, &c. Précédé d'une Introduction. Par M. le Docteur AMÉDÉE LATOUR. Quatrième Année, 1867. Paris: Germer Baillière, 1868. (From the Author.)

Des Nouveaux Procédés Opératoires de la Cataracte. Parallèle et Critique par L. WECKER, Prof. de Clinique Ophthalmologique Médecin-Oculiste de la Maison Eugène-Napoléon. Paris: Adrien Delahaye, 1868. (From the Author.)

Galvano-caustique Thermique. Par M. le Docteur A. AMUSSAT, Fils.

Transactions of the Obstetrical Society of London. Vol. IX. for the year 1867. London: Longmans, Green & Co., 1868.

Review of the History of Medicine. By THOMAS A. WISE, M.D., F.R.C.P., Edin., etc. etc. 2 vols. London: John Churchill, 1867.

On Diseases of the Chest: being Contributions to their Clinical History, Pathology, and Treatment. Part I. Diseases of the Lungs. Part II. Diseases of the Heart, and Thoracic Aneurism. By A. T. H. WATERS, M.D., F.R.C.P. Lond. Physician to the Northern Hospital, etc. London: John Churchill & Sons, 1868. (From the Author.)

The Morbid States of the Stomach and Duodenum, and their Relations to the Diseases of other Organs. By SAMUEL FENWICK, M.D., M.R.C.P., Lecturer on Comp. Anat. at London Hosp. Med. Coll., etc. etc. London: John Churchill & Sons, 1868.

Visceral and Hereditary Syphilis, with special reference to measures of public hygiene. By F. OPPERT, M.D., M.R.C.P. Lond., Phys. to City Dispensary, etc. etc. London: John Churchill & Sons, 1868.

Irritability: Popular and Practical Sketches of Common Morbid States, and Conditions bordering on Disease, with Hints for Management, Alleviation, and Cure. By JAMES MORRIS, M.D. Lond., Fellow Univ. Coll., F.R.C.S., etc. London: John Churchill & Sons, 1868.

On Consumption and its Treatment by the Hypophosphites. By JOHN C. THOROWOOD, M. D. Lond., M. R. C. P. Lond., Asst. Phys. to London Hosp. for Diseases of Chest. 2d ed. London: John Churchill & Sons, 1868.

The Surgical Treatment of the Diseases of Infancy and Childhood. By T. HOLMES, M. A. Cantab., Surgeon to the Hospital for Sick Children, Surgeon and Lecturer on Surgery to St. George's Hospital, etc. London: Longman & Co., 1868.

The Physiology and Pathology of Mind. By HENRY MAUDSLEY, M. D. Lond., Phys. to West London Hosp., Lect. on Insanity at St. Mary's Hosp. Med. School, etc. Second edition, revised. London: Macmillan & Co., 1868.

Lectures on the Theory and Practice of the Ophthalmoscope. By HENRY WILSON, F. R. C. S., M. R. I. A., Asst. Surg. to St. Mark's Ophthalmic Hospital, etc. Dublin: Fannin & Co., 1868. (From the Author.)

Vaccination Impartially Reviewed. Being one of the Prize Essays sent into the Ladies' Sanitary Association. By FERDINAND E. JENCKEN, M. D., M. R. C. P. London: John Churchill & Sons, 1868.

Anæsthetic Leprosy; with especial reference to its Diagnosis and Treatment in the earlier stages. By J. N., M. A., M. D. (From the Author.)

Atlas of Venereal Diseases. By A. CULLERIER, Surgeon to the Hôpital du Midi, etc. etc. Translated from the French, with notes and additions. By FREEMAN J. BUMSTEAD, M. D., Professor of Venereal Diseases in the College of Physicians and Surgeons, New York, etc. With about one hundred and fifty beautifully coloured figures, on twenty-six plates. Parts II., III. Philadelphia: Henry C. Lea, 1868.

Therapeutics and Materia Medica. A Systematic Treatise on the Action and Uses of Medicinal Agents, including their Description and History. By ALFRED STILLÉ, M. D., Prof. of Theory and Practice of Medicine and of Clinical Med. in University of Penna., Physician to St. Joseph's and to the Philadelphia Hospitals, etc. etc. Third edition, revised and enlarged. In two volumes. Philadelphia: Henry C. Lea, 1868.

On Diseases of the Skin; a System of Cutaneous Medicine. By ERASMUS WILSON, F. R. S. Seventh American from the sixth and revised English edition. With twenty plates and illustrations on wood. Philadelphia: Henry C. Lea, 1868.

The Indigestions; or Diseases of the Digestive Organs functionally Treated. By THOMAS K. CHAMBERS, Hon. Phys. to H. R. H. the Prince of Wales, etc. etc. Second American from the second and revised London edition. Phila.: Henry C. Lea, 1868.

Materia Medica for the Use Students. By JOHN B. BIDDLE, M. D., Prof. of Mat. Med. and General Therapeutics in Jefferson Medical College, etc. etc. Third edition, enlarged, with illustrations. Philadelphia: Lindsay & Blakiston, 1868.

Electro-Physiology and Therapeutics; being a study of the Electrical and other Physical Phenomena of the Muscular and other Systems during Health and Disease, including the Phenomena of the Electrical Fishes. By CHARLES E. MORGAN, A. B., M. D. New York: William Wood & Co., 1868.

Researches in Obstetrics. By J. MATTHEWS DUNCAN, A. M., M. D., L. R. C. S. E., Lect. on Midwif. in Surgeon's Hall Med. School; Phys. for and Clinical Lecturer on Diseases of Women in Royal Infirmary, etc. etc. New York: Wm. Wood & Co., 1868.

Circular No. 1, War Dep't, S. G. O., Washington, June 10, 1868, Report on Epidemic Cholera and Yellow Fever in the U. S. Army during 1867.

Chart of Venereal Diseases. By PHILIPPE RICORD, of Newark, N. J. New York: William Wood & Co., 1868.

Man: Where, Whence, and Whither? being a glance at Man in his Natural History Relations. By DAVID PAGE, LL. D., F. R. S. E., F. G. S., etc. etc. New York: Moorhead, Simpson & Bond, 1868.

Contributions relating to the Causation and Prevention of Disease, and to Camp Diseases; together with a Report of the Diseases, etc., among the Prisoners at Andersonville, Ga. Edited by AUSTIN FLINT, M. D. New York: Published for the U. S. Sanitary Commission, by Hurd & Houghton, 1867.

The Institutes of Medicine. By MARTYN PAINE, A. M., M. D., LL. D., Prof. of Institutes of Medicine and Materia Med. in Univ. of New York, etc. etc. Eighth edition, revised. New York: Harper & Brothers, 1867. (From the Author.)

A Manual of the Dissection of the Human Body. By LUTHER HOLDEN, F. R. C. S., Asst. Surgeon of and Lecturer on Anatomy at St. Bartholomew's Hospital, London. With Notes and Additions, by ERSKIN MASON, M. D., Demonstrator of Anatomy at Coll. of Phys. and Surg., etc., New York. Illustrated with numerous wood engravings. New York: Robert M. De Witt.

Researches into the Pathology and Causes of the Present Epidemy, ordinarily called "Yellow Fever." By Dr. H. D. SCHMIDT, of New Orleans. (From the Author.)

The Law of Human Increase; or Population based on Physiology and Psychology.

By NATHAN ALLEN, A. M., M. D., Lowell, Mass. New York: 1868. (From the Author.)

List of Medical Officers, United States Army, with their Stations as reported to the Surgeon General of the Army, April 1, 1868.

The Endoscope, and its Application to the Diagnosis and Treatment of Affections of the Genito-Urinary Passages. Lessons given at Necker Hospital, by A. J. DESORMEAUX, Surg. of the Hospital, etc. Translated by R. P. HUNT, M. D. Chicago, 1867.

A Medical Report upon the Uniform and Clothing of the Soldiers of the U. S. Army. Surgeon-General's Office, 15th April, 1868.

Cases of Ovariectomy, with some Remarks upon the Operation. By WM. WARREN GREENE, M. D., Prof. Surgery in Medical School of Maine.

Transactions of the Medical Society of the State of West Virginia, instituted April 10th, 1867, together with the Code of Ethics, Constitution, and By-Laws. Wheeling, 1868.

Proceedings of the State Medical Society of Kentucky. Meeting for reorganization held at Louisville, April 2 and 3, 1867, and the Thirteenth Annual Meeting held at Danville, April 7 and 8, 1867. Cincinnati, 1868.

Proceedings of the Academy of Natural Sciences of Philadelphia. January, February, 1868.

Lessons in Physical Diagnosis. By ALFRED L. LOOMIS, M. D., Prof. of Instit. and Practice of Medicine in Med. Depart. of Univ. of New York, etc. New York: R. M. DeWitt, 1868.

Fifty-Fourth Annual Report of the Trustees of the Massachusetts General Hospital, 1867. Boston, 1868.

Twelfth Annual Report of the Children's Hospital of Philadelphia. Philadelphia, 1868.

Twenty-fifth Annual Report of the Managers of the State Lunatic Asylum, for the year 1867. Albany, 1868.

Second Annual Report of the Metropolitan Board of Health of the State of New York, 1867. New York, 1868.

Annual Report of the Board of Health of the City of Toledo, for the year 1867. Toledo, Ohio, 1868.

Report of the Board of Health of the City and Port of Philadelphia to the Mayor, for 1867. Philadelphia, 1868.

The following Journals have been received in exchange:—

Vierteljahrsschrift für die Praktische Heilkunde, Herausgegeben von der Medicinischen Facultät in Prag. Redaction: Dr. JOSEF HALLA, o. ö. Professor der 2 Med. Klinik. XXV. Jahrgang, 1868. Bd. Erster, Zweiter.

Archiv der Heilkunde. Unter Mitwirkung von C. A. WUNDERLICH, in Leipzig, WILHELM ROSER, in Marburg, und W. GRIESINGER, in Berlin, redigirt von Prof. E. WAGNER, in Leipzig. Neunter Jahrgang, Hefter Zweites und Drittes.

Centralblatt für die Medicinischen Wissenschaften. Unter Mitwirkung von Dr. J. COHNHEIM, Dr. C. HUETER, und Dr. W. KÜHNE, redigirt von Dr. L. HERMANN. 1868. Nos. 1 to 23, except Nos. 6, 13, 15, and 16. 1868.

Deutsches Archiv für Klinische Medicin. Redigirt von Dr. H. ZIEMSSSEN, Prof. der Medicinischen Klinik in Erlangen, und Dr. F. A. ZENKER, Prof. der Pathologischen Anatomie in Erlangen. Vierten Bandes, Hefter Erstes und Zweites.

Archiv für Anatomie, Physiologie und Wissenschaftliche Medicin. Herausgegeben von Dr. CARL BOGISLAUS REICHERT und Dr. EMIL DU BOIS-REYMOND. Jahrgang 1868, Heft 1.

Bericht über die Fortschritte der Anatomie und Physiologie im Jahre 1867. Herausgegeben von Dr. J. HENLE, Dr. W. KEFERSTEIN, und Dr. G. MEISSNER, Professoren in Göttingen. Erstes Heft.

Revue de Thérapeutique Médico-Chirurgicale. Par A. MARTIN-LAUZER, M. D. Nos. 6 to 11, 1868.

Le Mouvement Médical: Journal de la Santé Publique. Rédacteur-en-Chef, N. PASCAL. Nos. 1, 6, 10, 11, 12, 13, 15, 16, 18, 19, 20, 21, 22, 23; 1868.

La Tribune Médicale. M. MARCHAL (de Calvi), Rédacteur-en-Chef. Nos. 23, 32, 33, 36; 1868.

Archives de Physiologie Normale et Pathologique. Publiés par MM. BROWN-SÉQUARD, CHARCOT, VULPIAN. Nos. 2, and 3, 1868.

Journal de Médecine de Bordeaux. Nos. 3, 7, 11, 1865. No. 1, 1866.

Gazette Médicale de Paris. Nos. 2, 3, 4, 5, 6, 7, 8, 9, 10; 1868.

Giornale Italiano delle Malattie Veneree e delle Malattie della pelle. Compilato e diretto dal dott. G. B. SORESINA, Ispettore Sanatorio di Milano. Anno III. Fascicolo 3, 4, 5.

The British and Foreign Medico-Chirurgical Review. April, 1868.

The Medical Times and Gazette. April, May, June, 1868.

The British Medical Journal. April, May, June, 1868.

The Lancet. April, May, June, 1868.

The Journal of Cutaneous Medicine and Diseases of the Skin. Edited by ERASMUS WILSON, F. R. S. April, 1868.

The Journal of Anatomy and Physiology. Conducted by G. M. HUMPHRY, M. D., F. R. S., Prof. Anat. in University of Cambridge, and WM. TURNER, M. B., F. R. S. E., Prof. Anat. in University of Edinburgh. May, 1868.

Edinburgh Medical Journal. March, April, May, June, 1868.

The Glasgow Medical Journal, April, 1868.

Dublin Quarterly Journal of Medical Science. May, 1868.

Medical Press and Circular. April, May, June, 1868.

The Indian Annals of Medical Science, No. 23. 1868.

Canada Medical Journal. March, April, May, 1868.

The Boston Medical and Surgical Journal. April, May, June, 1868.

The American Journal of Insanity. April, 1868.

The New York Medical Journal. April, May, June, 1868.

The Medical Record. April, May, June, 1868.

The Medical Gazette. April, May, June, 1868.

The Quarterly Journal of Psychological Medicine and Medical Jurisprudence. April, 1868.

The Buffalo Medical and Surgical Journal. March, April, May, 1868.

The American Journal of Obstetrics and Diseases of Women and Children. Edited by E. NOEGGERATH, M. D., and B. F. DAWSON, M. D. May, 1868.

The Medical and Surgical Reporter. April, May, June, 1868.

The Cincinnati Lancet and Observer. April, May, June, 1868.

The Western Journal of Medicine. May, June, 1868.

The Chicago Medical Examiner. April, May, June, 1868.

The Chicago Medical Journal. April, May, June, 1868.

The Saint Louis Medical Reporter. April, May, June, 1868.

The Detroit Review of Medicine and Pharmacy. April, May, 1868.

The Humboldt Medical Archives. March, April, May, June, 1868.

The Leavenworth Medical Herald. April, May, June, 1868.

The Cincinnati Medical Repertory. April, 1868.

The Richmond Medical Journal. April, May, June, 1868.

Atlanta Medical and Surgical Journal. March, April, 1868.

The Nashville Journal of Medicine and Surgery. March, April, May, 1868.

The New Orleans Journal of Medicine. April, 1868.

The Pacific Medical and Surgical Journal. April, May, 1868.

The Galveston Medical Journal. March, April, 1868.

The American Journal of Pharmacy. May, 1868.

The Druggists' Circular and Chemical Gazette. April, May, June, 1868.

The American Journal of Science and Arts. May, 1868.

The American Naturalist. April, May, June, July, 1868.

The Dental Cosmos. April, May, June, 1868.

The American Journal of Dental Science. April, May, June, 1868.

Communications intended for publication, and Books for Review, should be sent *free of expense*, directed to ISAAC HAYS, M. D., Editor of the American Journal of the Medical Sciences, care of Mr. Henry C. Lea, Philadelphia. Parcels directed as above, and (carriage paid) under cover, to Mr. Charles J. Skeet, Bookseller, No. 10 King William Street, Charing Cross, London; or M. Hector Bossange, Lib. quai Voltaire, No. 11, Paris, will reach us safely and without delay.

All remittances of money and letters on the *business* of the Journal should be addressed *exclusively* to the publisher, Mr. H. C. Lea, No. 706 Sansom Street.

The advertisement sheet belongs to the business department of the Journal, and all communications for it must be made to the publisher.

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 2. Rapport sur les Hôpitaux Civiles de la ville de Londres au point de vue de la Comparaison de ces Etablissements avec les Hôpitaux de la Ville de Paris. Par M. Blondet, et M. S. Ser, de l'Administration de l'Assistance Publique. Paris, 1862.
 3. Sixth Report of the Medical Officers of the Privy Council, with Appendix, 1863. London, 1864.
 4. Projet de Construction du Nouvel Hôtel-Dieu de Paris. Rapport fait au Conseil Municipal de Paris. Par Ambroise Tardieu. pp. 44. Paris, 1865.
 5. Plain Concise Practical Remarks on the Treatment of Wounds and Fractures; with an Appendix on Camp and Military Hospitals, principally designed for the Use of Young Military and Naval Sur-

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FOR JULY 1868.

ART. I. — *Experimental Researches into the Action and Therapeutic Value of Bromide of Potassium.* By Surgeon J. H. BILL, M. D., U. S. Army, Director of the U. S. Army Laboratory, Philadelphia, Pa.

THE researches upon which this article is based were undertaken to ascertain the limit of action, and fix definitely the therapeutic power of bromide of potassium.

The writer will first briefly record his experience in the use of this medicine in practice. He does so diffidently, conscious how comparatively small is the experience of a single experimenter.

In 1859, in consequence of a notice in the *Bulletin Général*, or perhaps the *Medico-Chirurgical Review*, of the treatment of nymphomania by bromide of potassium, we were led to make trial of it in onanism occurring in some music boys of the army. Five cases were treated, twenty grains per diem being given. The results were perplexing; for, although the medicine did seem to appease the venereal appetite for the first few doses, and benefit the cases so that hopes of cure were entertained, yet these in the end proved delusive; no one was cured. In treating these cases we discovered that the sensibility of the urethra was greatly lessened, so that catheterization, before unbearable, was easily borne. The fanciful notion which had at first presented itself to our mind, by which the phenomenon of anæsthesia had been referred to that scape-goat of therapeutics, the spinal cord, was dissipated on the discovery that this lessening of the urethral sensibility could be produced by injections into the urethra of bromide. The salt then acted locally, just like copaiba, or cubebs. It seemed probable to us, and later reflection has confirmed this view, that onanism, like "epilepsy," has a centric and excentric origin;

the latter seated in the urethra, the former, which must always be present, in the brain. The remedy had acted on the urethral origin of the disease. But the brain, abundantly able to give origin to the disease in its own limits, had not been restrained; and thus, whilst the appetite—the pleasure of the venereal erethism—was diminished, the power of the venereal act was unimpaired, and the cases were uncured. We have dwelt on this point because the extension of this argument will cover similar phenomena of abatement without cure in cases of epilepsy. We have not used bromide of potassium in cases of onanism occurring in the army since. The temptations of idleness and *ennui* are of far more consequence than the state of the urethral mucous membrane; but we wish to bear most positive testimony to the powerful antaphrodisiac action of bromide of potassium, and to express the belief that it may always be relied on as an adjunct to moral remedies. We would suggest that it be not used continuously, but in single doses, and only when there is evidence that the urethra is temporarily *excited*—as by constipation, excessive continence, ascarides, &c., and is *inciting* the brain to the vicious act.

The use of bromide of potassium before catheterization is a great boon to patient and surgeon. We have made it a practice to exhibit a small dose of the medicine before using the catheter. In chordee every one now knows the power of bromide. It is quite as effectual in small as in large doses. We have used it in one case of nephritic colic. The pain was assuaged, and the duration of the descent of the stone lessened; of course, after a stone has reached the bladder, the salt must be discontinued. The bladder must feel in order to extrude the irritant. A careful search through the medical literature of the last five years has convinced us that the most generally conceded property of bromide of potassium is its anæsthetic influence over the pharyngeal mucous membrane. One writer calls it an hypnotic; another, a sedative; each has used it in a special disease, with especial success, but all allow that it allays irritability about the pharynx. This point needs no further consideration. The salt may undoubtedly be made available in laryngoscopy, and to the operator on cleft palate.

Finally, we have, quite recently, noticed that bromide of potassium produced anæsthesia of the conjunctiva. Whether this property will be found practically useful in operations on the conjunctiva, or in the photophobia of granular lids, we cannot say. In practice we have employed the medicine in doses of twenty to thirty grains a day; but, with the exception of a papulo-pustular rash (almost invariable, though slight in degree), and the anæsthesia already discussed, we never saw any effect produced by bromide of potassium. Our patients remarked nothing unusual; no head pain, diarrhoea, or nausea. The pulse remained unaffected; the urine and feces *seemed* so. Particularly, no “nervous symptoms” (evidences of change in nerve nutrition) were ever noticed. It was,

then, with great surprise that we read the first announcements which began to appear in the medical journals in 1864, that bromide of potassium was hypnotic like morphia, and preferable to morphia, invariably inducing sleep. In some experiments on ourself and others, we failed to observe this property, and would have doubted the fact but for the continued assertions from all quarters of its successful use. The researches about to be detailed were undertaken especially to make clear this point. Certain that we must be wrong, we could not yet see how the profession at large was right.

All sorts of theories have been proposed, and some investigations made, to determine the action of this drug. Some seat its action in the heart; the pulse, however, is not affected—at least by medicinal doses. Most refer it to the nervous system, and, as the contrary cannot be proved, we might very well so refer it, until such time as the truth is known, were it not for the absurd applications which have been made of this theory. Thus it has cured everything nervous “from headache to hydrophobia.” One eminent writer of the Edinburgh school recommends it in diabetes, because diabetes is a “nervous” disease. Diabetes is a nervous disease, because section of the pneumogastric nerve produces what some pathologists have chosen to call diabetes. Here a theory is made to do, perchance, practical mischief, a patient’s recovery depending on a string of assumptions. Would it not be better for teachers to honestly confess ignorance, and give this as an incentive to students to investigate, rather than to theorize?

Recently scientific experiments have been made by two European investigators regarding the action of bromide of potassium on the inferior animals, and on the human body. Laborde has endeavoured to show that bromide suspends the reflex power of the spinal cord—or, so to speak, lays an injunction on the department of spinal reflex power. But, after a careful examination of the memoir, we have failed to understand how the spinal cord comes into question at all. Certainly, if Laborde’s announcement be correct, its correctness is not established by the experiments. It is not probable that any experiments can ever establish this theory, even if it be true. A fatal objection, however, to Laborde’s experiments, and also to those of Guttman and Eulenburg, is that they were made on the lower animals. No such experiments are of any value in therapeutics. Each tribe of animals has its own peculiar therapeutics. Thus, belladonna and stramonium are not poisonous to goats and rabbits. Anstie asserts that morphia acts on cats like strychnia. The writer knows from observation that the antelope of the plains can eat largely of tobacco. It is absurd, then, to predicate the therapeutical action on man of a drug from even its well-known and defined action on other animals.

Our experiments were commenced last summer, and were extended over a period of eight months. It was considered better to experiment on one

rather than on a number of persons, for although the risk of idiosyncrasy was by this plan encountered, the difficulty of controlling a number of individuals in their diet, habits, &c., seemed insuperable. We, therefore, by extending our researches over so long a period, hoped to secure all the advantages resulting from a perfect control of the habits, diet, and external conditions of the single individual, with all the safety of induction that observation extended to numbers of individuals insures. The plan obviated any differences arising from alterations in the health or nutrition of the body.

Each set of experiments was conducted independently of all others. Thus, the urine was examined for several days in succession, and then, immediately on the days following, bromide was given, and a comparison made of urine passed at the two periods. This was repeated, after an interval adequate to allow the body to recover from the effect of the drug, a sufficient number of times to warrant an induction. Uniformity of habits, diet, &c., was preserved through all the days of each experiment, and not through all the experiments. It will not answer, therefore, to compare the days when no bromide was taken of experiment No. 1, with the days when bromide was taken of experiment No. 2. The conditions of the two experiments were not identical. Frequent and systematic examinations of pulse and body heat were continued through all the experiments, the thermometer registering $\frac{1}{10}^{\circ}$ F. The results were entirely negative, and not worth recording. Urea was estimated in the usual way by mercury. Phosphoric acid was estimated by a modification of Sutton's method with uranium. Sutton's plan, as described in his Volumetric Analysis, and even copied by Aitken, is unreliable in the writer's experience.

Uric acid was estimated with great care. It is not enough to do what even so good an authority as Gorup-Besanez directs, simply to add eight or ten drops of muriatic acid to a measured quantity of urine. Urines differ in the amount of acidity present; some are habitually almost alkaline. Our plan is to add muriatic acid to a quantity of urine, until this acquires a fixed acidity. The standard we adopted was an acidity in 200 c. c. equal to one gramme of oxalic acid; great accuracy is not necessary. Two hundred cubic centimetres of the urine so acidified were then measured off and placed in a tall beaker, covered with paper, and exposed in a warm nook to the light. The beakers used should be of the same size, and great care taken not to scratch them in cleaning. Taking these precautions, estimations of uric acid are quite as satisfactory as estimations of any of the other urinary constituents.

Chlorine was precipitated in the presence of nitric acid by silver, and estimated on the balance. Bromine in the presence of chlorine was detected by the process of the writer as described in the *American Journal of Science and Arts* for March, 1868. Thus, briefly, chloride of gold produces no change in solutions of the chlorides; but if bromides are present,

strikes a colour ranging from orange to canary, according to the quantity of the bromide. The process is this, applied to the urine: Precipitate the mixed chlorides and bromides with silver in the presence of nitric acid; wash, and fuse with *perfectly* pure mixed carbonate of soda and potash (the carbonate soda and potash of commerce contains traces of bromide, and will not answer, for the test is very delicate—that made by igniting Rochelle salts is best). Dissolve, filter, neutralize with muriatic acid, and pour into a test-tube of white glass. Have another test-tube of the same size and colour, and fill with a weak solution of common salt, and make the liquids of the same length in both tubes. Add one drop of solution of chloride of gold to each tube, and shake. If any bromide is present, the tube containing it will show a yellow colour, especially when examined in the direction of its length, and as compared with the other tube. Without this test these experiments could hardly have been conducted, for between each experiment it was necessary to establish that all traces of bromide had left the urine. Frequently bromides were found in the urine two weeks after the last dose of bromide had been exhibited. Bromine in the presence of chlorine was estimated by the indirect method, the bromine being displaced by chlorine, and the analysis founded on the difference of weights before and after this operation.

The acidity of the urine was determined in the usual way, and the results were recorded as though an equivalent quantity of oxalic acid had been present. We used instead of litmus paper for marking the point when the urine became alkaline on adding the alkaline test liquid, a paper made from an acidified decoction of the *Coleus vershafeltii*. Alkalies turn this bright red paper green, whilst they turn the violet-red litmus paper violet blue. It is very easy to recognize the first signs of green on a bright red; it is very difficult to recognize the first appearance of blue in violet-red litmus paper—especially in a highly-coloured urine.¹ The amount of acidity is of very little consequence, as urine often changes so rapidly soon after passing as to become nearly alkaline before the analysis can be made. The results have not been thought worth tabulating.

Estimations of sulphuric acid were made, but results were found of no interest.

Soda and potash were estimated from the ash, and by the plan known to chemists as the “method of differences” in the state of chlorides. The process is very troublesome, and only a few estimations were made—not over twenty.

The urine was collected from eight o'clock of one day to eight o'clock of the next.

¹ Since the above was written the writer notices by recent journals that he has been anticipated in this employment of the *Coleus* by M. Boettiger.

The feces in the same manner were weighed, and then placed in a muffle, and this in a flue transmitting hot air.

The body weight was 160 pounds, and remained about the same throughout.

The carbonic acid was collected and estimated in the apparatus described in the note below.¹

No difference in the quantity of pulmonary water was observed to result from the administration of the bromide. No observations on the perspiration were made, save that on several occasions bromide could be detected in washings from sponging the whole body with water.

The series of six groups were first made. The results not being satisfactory, the second series of five groups were undertaken. The carbonic acid was particularly observed, as it was suspected to be diminished from the large quantity of unoxidized matter found in the urine when bromide had been taken. Moreover, we wished to trace a resemblance between known hypnotics, like morphia and bromide, in the power of the former to decrease the phosphates of the urine. The first series gave no results; the second did not answer the question, Does bromide of potassium diminish the quantity of phosphates like the hypnotics?—for, although the phosphates were diminished under excessive doses, so were the other urinary constituents.

¹ It was expedient to collect both the water and carbonic acid, as the former required examination, yet to collect them separately. The following is the detail: Two tubes $\frac{1}{4}$ inch internal diameter of caoutchouc were securely fixed, one in each nostril, and allowed to hang therefrom. At their lower ends they were provided with brass tubes, furnished with valves of mica, kept in their places by gravity, and raised by the slightest rarefaction of the air in the caoutchouc tubes. Thus, on inspiration, the valves flew up, and permitted a free flow of air to the nostrils; but immediately fell into their places on cessation of the inspiratory effort. Expiration through them was of course impossible. Inspiration was thus effected without labour. The expired air passed from the buccal cavity by a tube securely held by a mouthpiece through which it passed, grasped by the lips, and pressed backwards against the teeth, making an air-tight joint into a Liebig's condensing tube, surrounded by cold water, and this communicated by caoutchouc tubing and cork with a bottle. Thus all, or nearly all the water was condensed. The remaining gases passed next by a large glass tube into a Woulfe's bottle, with three tubulures, and was there dried by passing through a thin stratum of strong sulphuric acid. This arrangement served the purpose of a second valve, preventing inspiration by the mouth. The gas so dried next passed by the two tubulures through a series of small retorts filled with pumice soaked in melted caustic soda. Each tubulure had its own series of retorts. The gas was carried to the bottom of each retort by a glass tube, then rose up among the pumice, giving up its carbonic acid, and by way of the beak of the retort; and another glass tube was carried to the bottom of the second retort, and so on through both series of retorts. These, weighed before and after the passage of the gas, gave the amount of carbonic acid. Two experiments each day of half an hour morning and evening, were usually made, and then the results consolidated.

TABLE I.—*Showing Effect on Urine and Feces of Moderate Doses of Bromide of Potassium.*

NO BROMIDE TAKEN.										BROMIDE TAKEN.									
Date.	No.	Feces dry.	Urine.	Urea.	Chlo- ride of silver.	Phos- phoric acid.	Uric acid.			Date.	No.	Quantity of bromide taken.	Feces dry.	Urine.	Urea.	Chlo- ride.	Phos- phoric acid.	Uric acid.	Bro- mide (po- tass).
		grms.	c. c.	grms.	grms.	grms.	grms.					grms.	grms.	c. c.	grms.	grms.	grms.	grms.	grms.
July 2	1	33	1140	23.97	23.40	2.27	.310			July 5	4	5	17	1260	23.80	30.75	2.34	.413	
3	2	39	1060	23.10	22.56	2.45	.326			6	5	5	0	1110	27.60	29.18	2.67	.506	.37
4	3	37	1090	27.90	21.89	2.32	.330			7	6	3	29	1120	28.05	27.10	2.45	.490	.50
		37	1096	—	22.61	2.34	.322						15	1163	28.48	29.04	2.48	.469	
Aug 5	7	41	1150	32.00	—	2.40	.375			Aug. 7	9	6	0	1140	34.50	—	2.37	.390	
6	8	30	1220	33.97	—	2.65	.398			8	10	4	39	1190	34.87	—	2.45	.410	Urine No. 7, Vogel.
		—	—	—	—	—	—			9	11	4	0	1070	32.97	—	2.80	.516	..
		34	1185	32.98	—	2.52	.364						13	1133	34.08	—	2.54	.438	..
Aug. 25	12	..	1156	33.05	24.80	2.75	.362			Aug. 27	14	4	..	1160	34.75	30.92	2.90	.495	..
26	13	..	1130	33.63	23.60	2.87	.390			28	15	4	..	1210	32.01	34.61	2.95	.550	Urine No. 6, Vogel.
		—	—	—	—	—	—			29	16	4	..	1190	32.98	32.85	3.01	.710	.39
		..	1143	33.36	24.20	2.82	.376						..	1186	33.24	32.79	2.95	.591	—
Sept. 16	18	..	1160	30.86	27.08	2.60	.387			Sept. 19	21	6	..	1120	30.05	36.50	2.65	.450	No 7, Vogel.
17	19	..	1090	29.43	26.90	2.45	.400			20	22	6	..	1170	23.70	42.08	2.32	.480	No. 8, Vogel.
18	20	..	1000	29.60	23.35	2.85	.487			21	23	6	..	1120	27.87	—	2.36	.410	No. 7, Vogel.
		..	1056	30.30	27.87	2.63	.409						..	1136	29.20	39.29	2.48	.446	..
Oct. 5	24	37	970	31.35	21.80	2.50	.360			Oct. 8	26	8	0	1140	33.75	29.17	2.45	.400	39
6	25	36	1050	33.20	22.15	2.47	.390			9	27	8	15	1020	33.06	31.00	2.28	.590	.80
		36.5	1010	32.27	21.97	2.48	.375						7.5	1080	32.40	30.08	2.26	.470	—
Nov. 4	28	32	980	36.46	24.57	2.40	.325			Nov. 6	30	5	19	1030	37.80	29.88	2.95	.401	Urine No. 5, Vogel.
5	29	34	1010	35.70	24.32	2.86	.315			7	31	5	0	1070	35.40	31.16	2.89	.622	Urine No. 7, Vogel.
		—	—	—	—	—	—			8	32	5	25	1040	36.20	31.80	3.15	.718	.69
		33	995	36.08	24.44	2.63	.320						18	1036	36.46	30.94	2.97	.580	..

TABLE II.—Showing Effects on Feces, Urine, and Pulmonary Carbon of Large Doses of Bromides.

NO BROMIDE TAKEN.										BROMIDE TAKEN.											
Date.	No.	Feces dry.	Urine	Urea.	Chlo-ride of silver	Phos-phoric acid.	Uric acid.	Carbonic acid, hourly.		Date.	No.	Quantity of bromide taken in 24 hrs	Feces dry.	Urine.	Urea.	Chlo-ride of silver.	Phos-phoric acid.	Uric acid.	Carbonic acid, hourly.	Bro-mide (po-tas.)	
Nov. 20 21 2	1 2	grms.	c. c.	grms.	grms.	grms.	grms.	grms.		Nov. 22 23 4	3 4	grms.	grms.	c. c.	grms.	grms.	grms.	grms.	grms.	grms.	
		30	1150	36.18	23.50	2.75	.350	8.6	10			1570	32.40	2.20	.410	8.4					
		38	1210	34.90	23.78	2.60	.387	9.9	17			1200	30.60	2.05	.590	7.6					
		34	1180	35.50	23.64	2.67	.368	9.25	8.5			1385	32.33	34.20	2.12	.500	8.0				
Dec. 10 11 6	5 6	..	1070	31.00	..	2.57	.309	9.9	Dec. 12 13	7 8	11	..	1460	29.00	..	2.45	.595	8.5	..	Urine No. 7, Vogel.	
		..	1020	29.87	..	2.65	.305	9.7			11	..	1210	29.80	..	2.30	0 ?	8.35	General malaise.		
		..	1045	30.43	..	2.61	.307	9.8			..	1335	29.40	..	2.37	.297	8.42	Drowsiness. Albumen.			
Dec. 28 29 35	9 10 35	23	1140	39.45	24.87	2.67	.320	10.00	Dec. 30 31	11 12	11	11	1490	34.57	33.22	2.10	.560	8.97	.97	No. 7, Vogel, on all 3 days.	
		42	1080	38.17	24.02	2.87	.285	9.87			19	1495	30.10	36.01	2.10	.510	7.90	.90	Suffocative feeling, drowsiness, relieved by open air.		
		35	1060	38.81	24.44	2.78	.302	9.93			10	1375	26.50	30.80	1.87	0 ?	7.30	.78	Albumen in marked quantity. The CO ₂ of next day was 10.99.		
Jan. 23 24 15	14 15	45	1275	32.04	22.07	2.70	.390	9.8	Jan. 26 27 28 29	16 17 18 19	8	8	1314	30.07	31.04	2.90	.512	8.9	.57	Great discomfort and restlessness. Albumen present, bil-ary acids present. Fiftful sleep. CO ₂ two days after 10.50.	
		40	1220	33.45	21.53	2.85	.397	9.9			0	1285	33.40	33.80	2.85	.890	9.2	.53			
		42	1247	32.74	21.80	2.77	.363	9.85			0	1300	36.04	30.01	2.89	.780	9.0	.80			
		0	1390	24.18	26.60	2.05	0 ?	7.9			0	1310	22.01	20.19	1.10	0 ?	..				
Feb. 17 18 23 19 24	22 23 24	37	1090	31.54	20.77	2.60	.380	9.78	Feb. 20 21 22	25 26 27	12	0	1260	27.50	28.11	2.07	..	8.00	.94	Urine No. 6, Vogel. Drowsiness and suffo-cative feeling. Felt ill, great lassit-ude. Albumen in large amount.	
		35	1120	29.87	22.32	2.57	.360	9.98			12	0	1480	22.09	26.70	1.90	..	8.34	.57		
		36	1185	..	..	..	..	..			14	..	1230	17.10	20.75	..	..	6.97	.50		
		36	1185	30.70	21.54	2.59	.370	9.38			?	1323	22.23	25.18	1.98	..	7.77	..			

On examining the tables above, the following facts will appear. The quantity of urine passed in the twenty-four hours was increased by bromide. This was not due to the increased drinking of water. No thirst, not even with the largest doses, was ever present.

The acidity of the urine was usually increased [not recorded].

The colouring matters were invariably increased.

The urea was not affected.

The phosphoric acid varied. By small doses it was increased, *e. g.*, Nos. 14, 15, 16, of first table.

The chlorides always and notably increased, save when the bromide was acting as a poison. This chloride leaving the body was chloride of potassium. This might be inferred from our knowledge of the law of combination, but we wished to demonstrate it. We found, for instance, that after exhibiting bromide of sodium (which, however, failed to produce the anæsthesia of bromide of potassium), the chlorides were not much increased.

The figures of three experiments were an average of 22.56 grammes of chloride of silver in twenty-four hours on the days preceding the exhibition of bromide, and 24.29 on those days when that salt was taken. As before stated, when the potash salt was taken the chlorides greatly increased. Analysis showed in some of these cases the amount of potash in the urine increased from (estimated as chloride) 2.5 grammes to 12.80 grammes.

Bromides, even after poisonous doses, were hardly detectable. The figures are calculated to the weight of bromide of potassium, to allow of comparison between the amount ingested and that egested. No. 26 of first table, for instance, shows that eight grammes of salt were taken, and but four-tenths of a gramme passed the urethra. The amount egested was nearly the same, no matter what the dose. Bromides were always found in the lung water and the pharyngeal mucus, and in marked quantity in the feces. The bromides could always be detected for some time after the discontinuance of the salt, usually requiring ten days (once two weeks were required) to free the urine from its presence. Bromide of sodium did not cause much more bromide to appear in the urine than did the potassium salt. Its presence could be detected long after it had ceased to be taken.

The uric acid was increased by both bromides, but more marked by the bromide of potassium.

The carbonic acid of the lungs was decidedly decreased. Compare Nos. 2 and 4, Nos. 7 and 9, of the second table. This decrease in carbonic acid was followed on the days succeeding the use of the bromide by increase above the normal quantity. This increase is noticed in the column of "remarks."

Finally, the feces were diminished in weight, and usually procrastinated.

Having made some experiments for the comparison of the action of recognized hypnotics with the action of bromide of potassium, these are appended in a tabular form.

TABLE III.—Showing Effects on Urine of Medicinal Doses of Morphia, fasting.

NO MORPHIA TAKEN.					MORPHIA TAKEN.				
Date.	No.	Quantity of urine.	Acidity in oxalic acid equivalence.	Quantity of urea.	Phosphate in acid equiva.	Uric acid.	Urine of previous day examined and found normal.	Date.	No.
July 20	1	c. c. 960	grms. 2.11	23.13	grms. 2.03	.305	Urine of previous day examined and found normal.	July 24	2
July 29	3	990	2.25	23.89	2.19	.217		Aug. 1	4
		Quantity of urine.	Acidity in oxalic acid equivalence.	Quantity of urea.	Phosphate in acid equiva.	Uric acid.	Quantity of morphia taken in 24 hrs.		
		c. c.	grms.	grms.	grms.	grms.	Troy grs.		
		960	2.40	19.80	2.00	lost	1		
		990	2.20	17.10	1.98	.290	1.5		
									More excitement than narcosis. Sleep produced.

TABLE IV.—Showing Effects on Urine of Medicinal Doses of Extract of Hemp, fasting.

NO MORPHIA TAKEN.										MORPHIA TAKEN.									
Date.		No.	Quantity of urine.		Acidity in oxalic acid equivalence.		Quantity of urea.		Phosphate in acid equiva.		Uric acid.								
Oct. 15		1	c. c.	grms.	grms.	grms.	grms.	grms.	grms.	grms.	grms.	grms.							
			1000	2.40	25.16	2.30	.313												
			960	2.20	22.90	1.99	none?												
Oct. 25		3																	

TABLE V.—Showing Effects on Urine of Medicinal Doses of Narceine, fasting.

NO MORPHIA TAKEN.					MORPHIA TAKEN.				
Date.	No.	Quantity of urine.	Acidity in oxalic acid equivalence.	Quantity of urea.	Phosphate in acid equiva.	Uric acid.	Quantity of narceine taken in 24 hrs.	Date.	No.
Dec. 4	1	c. c. 980	grms. 2.25	23.47	grms. 2.05	.285		Dec. 8	1
		980	2.25	23.47	2.00	lost	6		
		Quantity of urine.	Acidity in oxalic acid equivalence.	Quantity of urea.	Phosphate in acid equiva.	Uric acid.	Quantity of narceine taken in 24 hrs.		
		c. c.	grms.	grms.	grms.	grms.	Troy grs.		
		980	2.25	23.47	2.00	lost	6		
									No narcosis. The acidity of urine due to excess of HO ₂ required to dissolve narceine.

A question which has excited some discussion is now to be noticed. Is the potassium or the bromine the active element in bromide of potassium? It is strange that such a question should arise. We have been giving salts of potash for ages, and no one ever before thought of classing potash among the hypnotics. Such salts, for instance, as the carbonate, nitrate, and chlorate of potassa, and even iodide of potassium, have no action like bromide of potassium. Thus chlorate of potassa, as we long ago observed, reduces the quantity of urea markedly and promptly.¹ Iodide of potassium, to be sure, increases the chlorides just as bromide does, but the action of the former on the system is notoriously different from the latter. Nor does bromine have hypnotic effects. Like chlorine, among other actions, it is stimulating to the heart, possibly by creating temporary congestion of the lungs. It appears, then, that it is the *salt* which produces the effects under discussion. Thus: When bromide of potassium meets chloride of sodium, chloride of potassium and bromide of sodium result. It might be inferred that this obtains in the body. But we have endeavoured to put it to the proof. The tables show a great increase of chlorides, when bromide of potassium had been given; and we discovered that this excess of chlorine was united, not with sodium (for there was less soda present than usual), but with potash, which was increased fourfold. An important change had evidently been instituted in the body. The bromide of potassium exchanged with the chloride of sodium of the body its bromine for the chlorine of the latter, so that chloride of potassium passed into the urine, whilst bromide of sodium remained behind in place of an equivalent quantity of chloride of sodium, and substituted for the latter in all its physiological relations to digestion, etc. Under these circumstances bromide of sodium may remain in the body for some time, in fact until it is displaced by the usual chloride of sodium ingested with the food. When taken by the mouth, bromide of sodium, in our experience, does not produce the same effects as bromide of potassium. Thirst is experienced, as if common salt had been taken; the feces are *not* diminished as when bromide of potassium has been administered. We look upon bromide of sodium as the physiological substitute of chloride of sodium. Thus chloride of sodium is the antidote of bromide of potassium, promptly interfering with the action of the latter. If these are admitted facts, bromide of potassium owes its peculiar power to its chemical constitution, or in other words, to the fact that it is a salt.

It will be noticed that the pulmonary carbonic acid was greatly decreased. The hypnotists would attribute this to a diminution of nerve force. But there is no evidence of any kind of such diminution in a healthy indi-

¹ In passing, we may mention that being affected with boils, and finding great excess of urea, we suspected that this might be the cause of our complaint, or at least a *consequence* of that state of nutrition which chlorate of potassa seems to change. Chlorate of potassa was used successfully then, and once since.

vidual, to whom even an enormous dose of the salt has been exhibited; and again, the effects of bromide in single doses do not increase with the dose. If one takes a full dose of morphia, sleep, even stupor, will result. There is no evidence that any *perfectly* healthy person has been put to sleep by a single dose of bromide of potassium. Moreover, after the first effects of morphia have passed off, we discover another set of phenomena. The nerve nutrition, so to speak, rebounds as far as it has been bent, and we see in the after effects of morphia (*e. g.*, tremor, nausea, headache, etc.) a nervous erethism as great as the previous nervous depression. This is not true of bromide of potassium.

Again, the true disturbers of nerve nutrition act in proportion to the dose. Bromide of potassium is as active in a moderate as in a large dose.

If diminution of the carbonic acid were a sign of diminished nerve action, then, on the removal of the cause, the amount of carbonic acid should simply attain its normal amount in the lung excreta. But it does not do this simply. For some time after the withdrawal of the bromide, the carbonic acid is increased above the normal standard, showing that nutrition of the body generally had not been interfered with, but only the way through the lungs barred. For these reasons we cannot accept a theory of a general hypnotism to account for the lessening of the carbonic acid.

We admit, however, and these researches show a diminution of function of the mucous membranes throughout the body generally, and this phenomena, if it extends to the pulmonary membrane, is quite sufficient to account for the decrease of carbonic acid. Is this diminution of function a vital, chemical, or physical phenomenon? At one time we held, from some experiments, that this diminution of function was a physical one. We thought we had discovered that bromide of potassium interferes with the osmosis both of urea and of carbonic acid gas. But after instituting very numerous experiments, we arrived finally at conclusions adverse to this explanation. There is certainly a singular action exerted on the osmosis of urea by bromine and by bromides, but our experiments have so far failed to determine it. A purely chemical cause will not account for the phenomena observed. We believe, therefore, that we must invoke a vital cause to account for this decrease in the carbonic acid—a vital cause limited in its seat and effects to nervous elements of the mucous membrane of the lungs.

It has become the fashion of late to regard bromide of potassium, and even to use it in practice, as a general hypnotic. Is this correct? We think not. Bromide of potassium is not a hypnotic, like morphia or hemp. We repeat it, it has not been shown that any one in perfectly sound health has been put to sleep by even an extreme dose of bromide of potassium. The fact seems to be, bromide has the power of checking certain outside interferences with sleep, of neutralizing certain causes of insomnia.

Morphia has no such power. Any person in health can go to sleep at will by taking a dose of morphia; nay, against his will. In health, bromide of potassium, in a single dose, is nearly without effect (save as an antaphrodisiac); in diseased states producing insomnia, it *allows* (not compels) sleep by cutting off the communication between the irritation and the sensory ganglion or ganglia taking cognizance of the same. Morphia does not act so. If sleep be produced by morphia in these cases, it is compelled. The action is exerted on the centre, not on the extremity. The cerebrum is overwhelmed, whilst the irritant may act and be felt to the last. Bromide, when it induces sleep, acts peripherally like chloroform. Then, too, how different is the sleep of morphia from that of bromide of potassium. In that of the former we have the intellect and higher centres first involved. A person can be but partially aroused. He can see, hear, feel; but he cannot think. He is still intellectually asleep: the cerebrum has been acted on primarily. When bromide of potassium induces sleep, we find a different condition present. The patient can be perfectly and at once aroused to full intellectual vigor, just as from natural sleep, whilst the local anæsthesia may remain. In fact, it is a natural sleep from which he is aroused. Is not this evidence that the cerebrum is not acted on at all; and if not the cerebrum, where can we more rationally seat the action than in the parts where the diseased state is located and whence the disturbing action flows? Whether or not we call bromide of potassium an hypnotic we must refuse to class it with morphia, hemp, etc. No doubt many cases of insomnia successfully treated with bromide can be accounted for thus, and as in cases of satyriasis, we have seen that bromide can cut off communication between the urethra and the cerebrum, preventing sexual erethism, so in cases of wakefulness depending on irritation of the alimentary canal, it can interrupt communication between the irritated mucous membrane and the cerebrum, and permit the latter organ to lapse into sleep. When bromide acts soporifically in those cases of insomnia (no doubt a large class) due to excess of blood in the head, its action is only secondary. It is the carbonic acid gas retained in the blood which acts soothingly on the excited cerebrum. There is nothing to show that bromide is a "derivative," or acts like food or spirits, the flesh-brush or cold douche in these cases of cerebral hyperæmia.

The reader will please remember that we have been discussing the action of bromide of potassium when limited to a single dose, however large, in states of disease. But can bromide of potassium be made to act in a healthy person as a hypnotic? Our experiments, detailed in table No. 2, show that it can. It is necessary, however, that the bromide should be continued for several days in doses of at least one drachm per diem. Two methods of accounting for this hypnotism suggest themselves; both are probably necessary. It will be remembered that bromide of potassium causes an increase of carbonic acid gas in the blood. A little

increase, such as might be occasioned by one dose of the bromide, will soon pass off, so soon in fact as the chloride of sodium of the body has changed the bromide of potassium into bromide of sodium. We have alluded to this when on the subject of "wakefulness." But when dose after dose is given, and no interval allowed for the carbonic acid gas to escape by its natural outlet, it will then accumulate in the blood in such quantities as to act on the cerebral masses, producing sleep. We think this is the best explanation of the soporific power of bromide when given repeatedly. The sleepiness is in its degree and kind the sleepiness of champagne, of redundant food, of a crowded assembly. The sleepiness passes off in the open air. The sleeper can be easily aroused. The sleep is not accompanied by dreams. It is light and fitful. All this is characteristic of the sleep occurring under the influence of carbonic acid gas in excess in the blood.

Still, we are bound to admit another explanation, or rather to admit that, in addition to the first explanation, it may be necessary to explain some cases of absolute somnolence observed (not by ourselves) by others, by granting actual hypnotic power to bromide of potassium. We have partly assumed, partly already proved, that when bromide of potassium is applied to the peripheral expansion of a nerve, it changes the nutrition of the cells of the same; or, in other words, is anæsthetic to them. Now, extend this reasoning. If bromide changes cell nutrition in a nerve expansion, why not in a ganglion or ganglia? If it can prevent a nerve receiving or transmitting a sensation, why cannot it prevent the centres from appreciating and acting on the sensation, why cannot it reduce them to passivity—to sleep? The supposition—mark, it is a supposition—is reasonable. If true, why does not one large dose of bromide of potassium act on the cerebral masses as it does on the peripheral distributions of those masses? If we could, through the circulation, apply bromide of potassium to the cerebral masses, such effects would possibly follow; but in practice we cannot do this—not, at least, by a single dose of bromide of potassium. Bromide of potassium is decomposed long before it can act in quantity on the brain. It is possible, however, that after the long continued administration of bromide of potassium, the whole of its antidote in the body, chloride of sodium, becoming decomposed, the bromide of potassium may circulate freely and unopposed as such, and as such invade the nerve-cells of the brain, and act on them in their congregation, as we have seen that it ordinarily acts on them in their dispersion. We put this explanation forth for what it is worth. We have never seen any phenomena which would require its adoption; others, however, may have made different observations.

Before concluding this paper we must allude to one theory of the action of bromide which we have already partly discussed, but from a different aspect.

Numerous cures of "epilepsy" have been attributed to bromide of potassium, and on the strength of them it has become fashionable to consider bromide of potassium as a troubler of the spinal cord—the antagonist of strychnia, for instance. We think these observers have begun the study of the subject at the wrong end. We can draw no conclusions as to the true action of a medicine from observing its action in disease, unless we know all the laws of that disease. But of all diseases, "epilepsy!"—what physician has not learned from bitter experience to mistrust all reputed cures of "epilepsy?" All reports of cases which fail to trace the fits to their origin are quite inadmissible in such an argument. Admitting that bromide of potassium will "cure fits," this cannot establish the action of the salt on the spinal cord, for the fits of epilepsy are usually excentric. If this line of argument be adopted, the seat of the disease must first be located. We can readily account for the beneficial effects of bromide of potassium if the excentric origin of the disease is seated in the mucous membranes of the alimentary canal, or of the genito-urinary cavities. A large number of the cases of epilepsy have just this origin. Bromide has power to interrupt the transmission of the irritating impression to the spinal cord in epilepsy just as we have shown how it may interrupt the transmission of the irritating impression to the cerebrum in wakefulness, or just as a ligature may postpone a fit by intercepting the "aura." But again, we protest against the belief entertained by many in the profession that any reliable scientific knowledge can be obtained from an exclusive observation of the action of drugs in disease.

To prevent misunderstanding, in conclusion, we beg leave to summarize our views. At the commencement of these researches we held the opinion, founded on our own observation and the practice of others, that bromide of potassium is an anæsthetic to the mucous membrane, and referred all its so-called hypnotic power to this property. Our researches have confirmed whilst enlarging our earlier belief. We now beg leave to suggest that *bromide of potassium, in its legitimate action, is an anæsthetic to the nerves of the mucous membranes, and a depressor of their action.* Its hypnotic effects are secondary.

U. S. ARMY LABORATORY, PHILAD., March 1, 1868.

ART. II.—*Carbolic Acid as a Remedial Agent.*

By W. KEMPSTER, M. D., Utica, N. Y.

THE merits of this comparatively new antiseptic and disinfectant have been thoroughly discussed, and the highest value accorded to it. Its powers have doubtless been exaggerated, nevertheless it stands in advance of any other article of its class both for efficacy and variety of application.

It is not my intention, however, to speak particularly of it as a disinfectant, but rather to offer a few suggestions concerning its use as a therapeutic agent.

Carbolic acid,¹ though discovered by Runge, a German chemist, in 1834, has only within the past few years been brought into general notice. It is prepared from the distillation of coal tar, and, as found in market, is a dark-brown coloured liquid, having a very pungent odour not unlike coal tar, but much more powerful. This variety is known as commercial carbolic acid, and is the quality used for disinfecting purposes; it is not, however, pure carbolic acid, but contains a variable proportion of cresylic acid. This latter, although an excellent disinfectant, is not used for internal administration.

Pure carbolic acid is a white crystalline substance, the particles adhering with considerable tenacity, and after standing for some time, especially if the bottle be frequently opened, becomes slightly deliquescent and more tightly packed together. The two varieties of crystallized acid more generally found in the American market are prepared by Merck, of Darmstadt, and Calvert, of Manchester, England. Merck's preparation has a slight reddish tinge. Calvert's is quite white, having the appearance of snow which has been soaked in water. Merck's contains about 98 per cent. of pure acid, and is slightly more deliquescent than Calvert's, which is pure. Merck's, however, is sufficiently pure for all practical purposes, and is furnished at a lower price.

I have been thus explicit in reference to the article, as in some of the medical journals, writers speak of giving a *drop* or two of *pure* carbolic acid, evidently referring to a solution of the crystals.² Until an official solution is announced, it is better to purchase the crystals and make our own solutions. There are two prominent adulterations already in the market—*carboline* and *cresyline*—the former containing, according to an English chemist (Crooke), about 4.1 per cent. of carbolic acid; the latter, little or none.

The first application of this agent, under my own observation, occurred in a case of catarrh, where the discharge was profuse, offensive, and consequently very annoying to the patient. Various remedies had been previously tried, without success. Hoping to derive advantage from its properties as a disinfectant, it was administered to the patient by inhalation, using one grain to an ounce of water, and conveyed the liquid to the affected parts by means of a steam spray-producer. The effect surpassed my most sanguine expectation. It not only relieved the feter, but in the course of two or three inhalations changed the character of the discharge, and the patient recovered rapidly.

¹ It is incorrectly called an acid; it belongs to the class of alcohols.

² A variety of solutions have been put in market under the title of pure carbolic acid.

This induced a trial in a second case, not so serious as the first, but still severe, and the result was equally satisfactory, the symptoms all disappearing in the course of four weeks. After the first few inhalations, the patients were instructed in the use of the spray-producing apparatus, furnished with a bottle of the solution (one grain to the ounce), and directed to inhale the vapour for ten minutes at a time, both morning and evening; enjoining upon them not to leave a warm atmosphere for half an hour after each inhalation.

It is used at the present time in the treatment of ozæna, nasal polypi, and diseases of the nasal passages in which there is an offensive discharge. Even if it exerted no curative action, its power to correct fetor would be a great recommendation; but this is not all, it stimulates the ulcerated surface to a healthy action, promotes normal granulation, and thus assists in the curative process. This remedy is also employed by some of the physicians who are engaged in the special treatment of throat and lung diseases, particularly French practitioners, who direct that it should be inhaled in combination with other appropriate remedies. They speak highly of its efficacy in cases of ulcerated sore throat, chronic bronchitis, and that morbid condition of the mucous surfaces of the air passages which gives rise to a constant expectoration of a muco-purulent material. If a solution of one grain of the acid to an ounce of water does not seem to meet the indication, the quantity may be increased to five grains, or even more; but it is better to begin with a mild solution, gradually increasing the strength until the desired effect is obtained.

My next use of the acid was in a case of scarlatina, where the breath was particularly obnoxious, owing to an ulcerated condition of the throat. A gargle of two grains of the acid to an ounce of water relieved the fetor at once, and apparently proved beneficial. No other gargle or application to the throat was used.

It would seem to be appropriate in cases of diphtheria, a strong solution of the acid being used for a local medicament; its power to correct the foul breath would be an indication for its use, and its astringent and stimulating properties might prove beneficial. In cases of common sore throat (simple tonsillitis) it is found to answer admirably, with the advantage over the ordinary potassa gargles of relieving the "bad taste" and foul breath.

In the State Lunatic Asylum at Utica, it is successfully used to relieve cases of sluggishness of the bowels, accompanied by offensive breath. The dose is a drachm of a solution of one grain to the ounce (which is the house standard). A striking exemplification of the efficacy of this remedy occurred in the case of a melancholic patient admitted to this asylum. He had for a number of years suffered from attacks of dyspepsia, accompanied with acid eructations and the formation of gas. Latterly these symptoms became continuous. He complained of intense

heat, and pain in the stomach; stated that the eructation of fetid gas had become unbearable; and the same smell emanated from the cutaneous surface, so that it was offensive to every one in the room. He was at once put into a warm bath, then thoroughly washed with a solution of the acid (gr. v to the ounce). Internally two drachms of the standard solution were given three times daily for two days. At the end of this time the breath was sweet, and no unpleasant exhalation from the skin was perceptible. He was also relieved from the painful distension produced by the formation of gas in the stomach and bowels. Whenever he feels the approach of this difficulty, two or three doses of the house preparation relieve him at once from this unpleasant and painful complication.

Yeasty stomach, sometimes consequent upon a meal of rich food, which produces flatulence and expulsion of gas, with a tendency to regurgitation, is usually relieved by a drachm or two of the solution above mentioned; this checks the fermentative process. The power it possesses to arrest fermentation would be an indication for its employment in sarcina, but the opportunity has not offered for me to test this. Diarrhoea produced by eating unripe fruit or other articles which promote fermentation is speedily relieved by combining a drachm or two of the solution with the usual remedies. As a dentifrice, commingled with myrrh or some aromatic, it removes the odour arising from carious teeth.

As an external application, the acid possesses valuable properties. On the continent of Europe it is quite extensively used at the present time as a dressing for various wounds. A *résumé* of Prof. Lister's paper upon its use, particularly in cases of compound fracture, was given in the number of this Journal for October, 1867, page 541 *et seq.* Various continental surgeons speak highly of it in this connection. It is used in solution, with which cloths are wet, and applied to the wound; or in the form of putty, with which the parts are covered. In either case it is a gentle stimulant, kills what organisms come in contact with it, acts as a deodorizer, prevents flies from coming near, and the breeding of maggots. I have seen great benefit derived from its use in the treatment of bedsores. In one case, where there was a gangrenous tendency, with extensive sloughing, and a devitalized condition of the surrounding tissue, a solution of fifteen grains to the ounce cleaned the surface of the ulcer at once, and stimulated normal granulations, which led to a rapid healing of the wound. Where there is a tendency to the formation of bedsores, sponging the parts with a solution of the above strength seems to operate beneficially.

An ulcer situated between the cheek and alveolar process of the left malar bone, discharging a thin sanious pus, was syringed out with a solution of the strength last mentioned. The pus became laudable, the discharge less in quantity, and the wound healed rapidly.

One of the assistants connected with this institution punctured his finger at a *post-mortem* examination. Forty-eight hours thereafter the

wound became an ill-conditioned ulcer, with an inflamed base, the redness extending some distance beyond; and the course of the lymphatics could be traced above the wrist. At my suggestion he applied the crystallized acid, removing it by a stream of cold water after a slight eschar had been produced. It changed the condition of the ulcer at once, which without further treatment healed.

A patient applied to me for something to relieve the "burning heat" in her arm. I found it to present an appearance like that which precedes superficial erysipelas, to attacks of which she was subject. A cloth wet with a two-grain solution was applied; it relieved the heat at once, and the following morning all symptoms had disappeared.

An unguent made of five grains of the acid to an ounce of simple cerate corrects the odour attendant on cancerous discharges, and it is also recommended for overcoming fetid perspiration from the axillæ or feet. A stronger unguent—ten grains to the ounce, or what is preferable, a glycerolate of this strength—destroys the *Acarus scabiei*, *Pediculi capitis*, *et id genus omne*.

As a remedial agent in certain forms of skin disease it seems to possess decided advantages. A patient applied for something to relieve a disordered condition of the scalp, which had existed for some time. It proved to be a well-marked case of *Tinea capitis* in an advanced stage. The crusts had cracked open, with a straight smooth fracture, presenting a shining floor, looking as though the scalp had opened and exposed the cranial bones. There were several of these cracks, measuring from a half inch to two inches in length, the principal ones occupying a position over the region of the anterior fontanelle, and extending several inches in each direction. Other crusts had formed over the temporal and occipital regions. In order that the acid might be effectually tried, the hair was cut short, and the entire scalp washed with a solution of the acid (two grains to the ounce) four times daily. The subsidence of the disease was marked; those crusts in process of formation were checked, and the dry grayish crusts already formed, with those cracked open, were speedily removed. After the wash had been continued for one week, a glycerolate of carbolic acid¹ (strength five grains to the ounce) was applied, which possesses the advantage of being a more permanent preparation. The treatment was commenced January 7th, and at the date of writing (January 28th) the disease has disappeared. No other treatment, either internal or local, was employed. One other case has been mentioned to me, which was even more severe than this, and in which various modes of treatment had been employed without arresting its progress. The treatment mentioned above was resorted to, with an immediate abatement of symptoms and rapid

¹ The odour of the acid can be overcome by the addition of a few drops of oil of lemon.

recovery. We have used the glycerolate mentioned in cases of Herpes circinatus, with entire satisfaction.

During the month of December, 1867, I was called to see a girl aged four years, who had been taken suddenly ill. The symptoms indicated scarlatina, and, as there were a number of cases in the neighbourhood, that diagnosis was made. She was immediately put upon milk-punch and carbolic acid solution, the one-sixteenth of a grain three times daily. I also directed that her face should be washed in water containing a spoonful of the solution (one grain to the ounce), and that the mouth should be sponged out with the same—directing also the use of the commercial acid solution about the house as a disinfectant. At the end of four days the internal administration was discontinued; not because of any unpleasant symptoms, but its continuance did not appear necessary. The mouth-wash, of which the child swallowed a few drops, and all the other applications, were continued; the body being anointed with olive oil, tinctured with carbolic acid. From first to last no untoward symptom appeared; the fever subsided on the fifth day. The throat was not very sore; the tongue was relieved of the creamy coat after the third day; there was no offensive breath, and the child made a complete recovery. No other treatment was employed. A brother of this child, two years older, who had never contracted the disease, and who was with her constantly, had no symptoms of the disorder. His face was washed twice daily in the solution above mentioned.

The medical superintendent of this asylum, Dr. John P. Gray, informs me that in a family of six children, three were simultaneously attacked with scarlatina anginosa. They were put upon a course of treatment similar to the above, the house being thoroughly disinfected. They made a good recovery. The other three children were not attacked, although they were in constant communication with the sick ones. It is not assumed that the carbolic acid *cured* the children, or that it prevented the disease from attacking the rest. If, however, it is only a coincidence, it possesses the merit of being a very remarkable one, and will occupy our close attention in the future, as occasion may present. A prominent practitioner of this place, Dr. D. P. Bissell, now treats scarlatina in the manner indicated, and expresses himself as better pleased with this than any method hitherto tried, and states that he “don’t want to treat scarlet fever without carbolic acid.”

Dr. Gray has spoken to me of a case (sequel of scarlatina anginosa) in which there occurred a very fetid discharge of ichorous pus from the ears and nostrils of the patient. A mild solution of the acid (two grains to the ounce of water) was thrown into the nares and auditorius externus, with the effect of arresting the sanious discharge, and causing its disappearance.

Dr. Bissell states that he has used a solution of carbolic acid—strength two grains to the ounce, the dose being one drachm—as a vermifuge,

and has not been disappointed with the remedy. The *oxyuris vermicularis* (pin worm) may be at once destroyed by using as an injection a drachm of the solution to four ounces of water.

As an escharotic its action is prompt, but superficial. It has a tendency to spread; this can be easily stopped by the application of water. The effects produced upon ulcerated surfaces are not transient; it seems to exert its power as an alterative for some time after the peculiar odour has disappeared.

As an injection for gonorrhœa it has proved itself equal, or I may say superior, to the ordinary remedies, and is less painful; the solution used being two to five grains to the ounce. The crystallized acid would seem to be indicated in the treatment of syphilitic ulcers, but upon this I cannot speak from observation.

Though it was not my intention to speak of this agent as a disinfectant, as it concerns the sick-room directly, yet some remarks may not be inappropriate. Nearly every practitioner has experienced the unpleasant odour emanating from the lying-in room. This may be entirely overcome by the proper use of the solution of commercial acid—a half ounce of which put into a gallon of boiling water, makes a strong solution—all, indeed, that the water will take up—which if filtered to remove oily matters, may be thrown about the floor with impunity. Two table-spoonfuls at a time are sufficient to disinfect and deodorize a large room, and one-half the quantity is generally sufficient. A few drops sprinkled upon the napkins, and applied to the genitalia externa, will remove the unpleasant, pungent odour which accompanies the lochial discharge; thus exempting the patient from a great source of discomfort. A small quantity of the solution put into the close stool before use, destroys the odour which would otherwise occur. Wherever it has been introduced with these objects in view, it has received the unqualified approval of those most interested.

Carbolic acid at once arrests the development of the lower forms of organic life. It stops the fermentation of yeast, kills microscopic infusoria and cheese mites. Nor does its influence end here. In order to test its destructive power over insect and animal life, I procured a cricket, smeared the inside of a wine-glass with the commercial carbolic acid, and inverted it over the cricket, leaving sufficient space at the bottom to allow a supply of air. Immediately after the glass was inverted, the cricket made violent attempts to escape, lasting two or three minutes. It then staggered about and fell over, had a few severe convulsions, and died. A cockroach was next tried, with the same result; it was from ten to fifteen minutes in the vapour.

A mouse was procured, and put into a wide-mouthed, four-quart bottle. A piece of sponge saturated with two drachms of commercial acid was lowered into the bottle and suspended about two inches from the

bottom. Five minutes after the introduction of the sponge the mouse staggered as if intoxicated, the movements continuing for fifteen minutes, when a short respite occurred. These paroxysms were repeated several times during one hour and a half, then the animal became violently convulsed, the spasmodic action lasting thirty minutes, when it died. Upon examination it was found that the membranes covering the brain and spinal cord were injected, some of the vessels being very large. The lungs were of a light pink color, many shades above that observed in the normal human lung; they were collapsed. The heart appeared large, and felt hard: upon opening the organ it was found distended with very dark clots, which bulged out as the incision was made.

A full-grown rat was next subjected to the vapour of carbolic acid; and its manifestations were more strongly marked in this than in the former experiments. The animal was a vicious one, exhibiting great ferocity; but in less than one minute after the sponge containing the acid had been introduced, the animal appeared sleepy, and as if intoxicated. Twice the animal reared upon its haunches, as if it desired to climb, but had not the strength to do so; and, after each attempt, it fell over upon its right side. At the end of forty-five minutes a tremor was observable over the entire body, and it ceased to notice sudden sounds; shortly after this it failed to perceive that it was being handled, and presented all the phenomena of profound anæsthesia. Convulsions followed the tremulousness, which continued to increase in violence until the animal's death, which occurred in one hour and forty-five minutes after the introduction of the sponge. The vessels in the pia mater were found congested, some of them being very much distended. The larger lobes of the brain (cerebrum) presented a greater number of bleeding points than is usually found; the smaller lobes (cerebellum) were highly congested—the vessels being considerably increased in size. The spinal cord appeared exsanguinated in all but the cervical region, which presented a uniform pink blush. The lungs were collapsed and several shades lighter in colour than usual. The heart was tense; and, on being opened, a clot bulged out which filled both left auricle and ventricle.

The same experiment has been performed twice since, the result being alike in each case: in the last instance the convulsions occurred at the end of eighteen minutes; they were more violent in character, and death occurred sooner (fifty minutes).

A peculiarity was noticed in connection with the convulsive movements of both insects and animals—which was, that the forward legs were first convulsed, the spasm ceasing to a great extent in them, as the posterior members became affected; and also that, as the spasm commenced, the animal fell over upon the right side.

As an instance of its influence upon vegetable life, the following will suffice: During the last summer a rose-bush became infested with lice. I prepared a solution of carbolic acid (commercial), one-half ounce to the

gallon of water, and sprinkled the plant with it. Four hours afterward the lice were all dead, and so was the plant, the leaves being withered as if blighted by heat.

Accepting Prof. Saulsbury's statements concerning the cause of intermittent fever, we might expect from the use of the acid a potent remedy. I have not, however, had the opportunity to test it.

The above is simply a statement of my experience with the remedy. I believe it to be potent for good; but, like other remedies, on being generally introduced, it will meet with condemnation, because it does not fulfil every indication which enthusiasts have claimed for it. It will, however, gradually win by its good effects a prominent position among the list of valuables which enrich our *materia medica*.

STATE LUNATIC ASYLUM, UTICA, N. Y., March 4, 1868.

NOTE.—A rat killed by inhaling the vapour of the acid, February 21, is at this time, April 20, 1868, as free from the odour of putrefaction as it was the day it died. It has been kept in a warm room during the time. No indication of decomposition is apparent.

ART. III.—*Clinical Observations on the Morbid Effects of Cold.*

By W. E. WATERS, M. D., Assistant Surgeon U. S. Army.

WE have had frequent opportunities of observing the morbid effects occasioned by exposure to severe cold during a residence of two winters at Fort Bridger, Utah Territory. The post is located in an elevated and cold country on the overland stage route, and through it there is more or less travel during the most severe weather of winter. Heavy snow-storms, accompanied by high winds, are of frequent occurrence, and while they prevail it is common for men, perfectly familiar with the country, to get lost and be compelled to remain out until the storms have ceased. Most of the accidents that will be reported in this paper occurred under such circumstances. During the past winter the weather has been unusually cold. In the month of January the thermometer stood below zero continuously at all hours of the day and night for seven consecutive days. The mean temperature, from three registers every twenty-four hours, for that month was $8\frac{79}{100}^{\circ}$ above zero. The latitude of the post is $41^{\circ} 18'$; the longitude, $110^{\circ} 32'$; and it has an elevation of 7010 feet above the sea.

We propose to report in this article typical cases of the various pathological conditions referred to by surgical writers, as resulting from frost-bite and freezing. There is one condition, however, which authors describe, viz., the complete and immediate death of a part from the effects of cold before any reaction or inflammation whatever has taken place, which, in

our opinion, cannot result from exposure to the atmosphere at the lowest temperature ever experienced. The powers of man to resist the evil effects of low temperature is very great. However languid the circulation may be in a part, and however intense the cold (even when the part be but slightly protected by clothing), if the exposure be not sufficient to destroy the individual, reaction will take place.

The application of intense cold in a solid form, as, for instance, by frozen mercury, may cause the immediate death of the surface with which it is brought in contact, and form an eschar in the same manner as would the contact of a solid body of a very high temperature. But if any considerable portion of a limb should become so congealed by a cold atmosphere as to result in immediate sphacelus, the low temperature necessary to such a result would at the same time destroy life, either by excessive congestion of some of the vital organs, or by a reduction of the temperature of the blood below the standard necessary to secure its continued circulation through the heart.

That a portion of the body will completely and speedily react when apparently lifeless from exposure to cold is easily demonstrated. Dr. Hayes mentions the case of an Esquimaux who had his foot and leg frozen as high as the knee, and "to such an extent that it was stiff, colourless, and apparently lifeless;" but the part reacted, and he recovered so completely that in three days he was walking about with only a slight frost-bite on one of his toes. As will presently appear in the report of a case that came under observation at Fort Bridger, a man had both his feet frozen to such an extent that the parts higher up than the ankles became as stiff as if made of plaster; reaction came on and a high grade of inflammation supervened, but not to terminate so happily as in the case of the Esquimaux. It will also be noticed in this case that while the remainder of the body was so warmly clad as to retain much of its heat, the constitutional effects of the exposure so nearly destroyed life as to require vigorous and prolonged efforts to keep up the vital functions.

A portion of the body may have its heat so rapidly abstracted by the evaporation of a spray of ether or chloride of methylene as to freeze it and render it insensible to pain under the surgeon's knife, but in a few minutes reaction takes place and the part resumes its healthy condition and functions. Some of the lower animals may have their entire bodies frozen stiff and recover; and cocks may have their combs congealed so as to be brittle, and vitality will be restored. It is, therefore, reasonable to suppose that the death of a portion of the body, even to a very superficial extent, cannot follow as the *immediate* effect of abstraction of heat through the atmosphere; but is the result of an inflammatory process which itself is the consequence of the freezing.

CASE I.—Private T. E. G——, Company H, 36th U. S. Infantry, aged about 24; feeble constitution; a prisoner in the guard-house at Fort

Bridger, escaped, with several others, by digging under the walls, at about 8 o'clock on the evening of March 30th. He travelled on foot several miles through the snow, when he was arrested and brought back to the post. Soon after leaving the fort his feet became wet in wading a stream. He was gone about six hours. Was examined at sick call, 8 o'clock the next morning, when both feet were found to be more or less congested, swollen, and painful. Both great toes, with some of the other toes, and the outer edge of the feet were of a different appearance from other parts, being pale and somewhat mottled. He complained of a smart burning and pricking sensation, as if the parts had been exposed to hot fire, and was unable to bear them on the ground in walking. Painted the entire inflamed surface with compound tincture of iodine, and ordered a quarter of a grain of morphia to be taken then and repeated at night, and that he should be kept in his bunk.

April 1. Inflammation rapidly disappearing from the feet, but appearance of toes same as yesterday. .

4th. Inflammation entirely subsided from both feet, except one great toe, which remains somewhat swollen and tender, though there is no vesication or tendency to ulceration, and the patient is about as usual.

The above case exhibits the most simple of the effects of exposure to cold which require surgical treatment, and if it had not been for one circumstance mentioned, the wetting of the feet, no unpleasant consequences would have resulted. On the evening the prisoners escaped the register of the thermometer, at 9 o'clock, was 30° above zero, and at 7 o'clock the next morning only two degrees lower. During the night it was probably a little colder; but it was not cold enough, nor was the exposure long enough, under ordinary circumstances, to have injured the man's feet had they not been wet at the time. He had frequently, during the winter, worked out of doors in the snow for a longer time than he was absent that night, and when the temperature was much lower, without experiencing any unpleasant results. Five or six other prisoners escaped with G—— and were captured at the same time; and, except one man, whose feet had also been wet, none of them suffered the slightest inconvenience.

The first impressions produced by exposure to cold are the same as those produced by heat. Capillary congestion of the surface takes place, accompanied by the usual symptoms of heat, redness, pain, and swelling, and when the congestion is slight, as in the case reported, no other pathological condition manifests itself. The swelling is attributed only to the distension of the walls of the vessels, which soon resume their natural calibre, and the circulation goes on unobstructed. If the exposure be continued for some time after the parts become congested, a secondary effect takes place, viz., the blood retreats from the surface, the capillaries contract, and some of the blood may coagulate in the subcutaneous veins, leaving the surface pale and of a whitish mottled appearance, as was presented in the toes in the case reported. After a still longer exposure, or when the temperature is lower, an effusion of the watery parts of the blood sooner or later follows,

and extensive vesicles form. An example of this kind will be presented in the case to be reported next.

No treatment could be more satisfactory in its results than that of the application to the parts of compound tincture of iodine in such cases as the one reported. It has been my invariable practice, and has never disappointed me. In some cases where the congestion has run into inflammation, which has existed for several days, and the parts are swollen, painful, and presenting the fiery appearance of erysipelas, a few applications have caused the swelling to subside, the pain to cease, and a healthy surface to present itself under the desquamating cuticle.

CASE II.—William Johnson; citizen, aged about 30, healthy, temperate habits, on the morning of December 28th, 1867, started from Muddy Fork, fifteen miles from Fort Bridger, to drive cattle to the post. He was on foot, and there were six inches of snow on the ground. Losing his way, he wandered about all day, and as night came on and it grew colder, he commenced experiencing in his feet, which had been cold for some time, a very painful burning and numb sensation. Fearing that his feet were freezing, he took off his boots and socks. His feet were swollen, red, and painful, with his heels and toes assuming the appearance described in Case I. He then rubbed them persistently with snow for several minutes, and putting on his boots and socks walked all night, reaching the point whence he started early the following morning. His feet were then very painful and congested over most of the surface, but pale and shrunken where the circulation was most languid. He immersed them in cold water for two or three hours, which afforded relief. The following morning vesication commenced about the toes, heels, and ankle-joints. The vesicles were at first filled with a colourless liquid; but after a few hours it began to turn red, and finally assumed a dark-purple colour. On the third day after the exposure (January 1st) he was brought to the post for professional treatment. The toes, heels, outer edge of the feet, and about the ankle-joints were covered with vesicles, as above described, and the whole feet were red, swollen, and painful. Some of the vesicles had been ruptured, but most of them were distended with the dark effusion. The inflamed surface was painted with the compound tincture of iodine, and the vesicles most distended were evacuated by small punctures. The whole was then enveloped with lint spread with a mixture of lime-water and cod-liver oil.

Jan. 3. Inflammation rapidly subsiding; under the vesicles of one of the heels there is some ulceration, and one of the great toes is becoming gangrenous; no line of demarcation forming. Continued treatment.

8th. Line of demarcation formed about the metatarso-phalangeal joint of the mortified toe; patient objects to the removal of the dead part with the knife. Applied poultice of linseed meal to the gangrenous toe, and continued lime-water and cod-liver oil to vesicated and ulcerated surfaces, which are rapidly healing.

23d. Parts nearly healed, except the gangrenous toe, which was removed at the point of separation between the living and dead tissues.

This case is cited as an example of the more serious consequences of exposure for a longer time, and to more intense cold. At nine o'clock on the night the man was out, and at seven o'clock on the morning he got

back, the thermometer indicated, respectively, 7° and 12° *below* zero. The atmosphere was dry and clear, and the feet were kept dry, otherwise a more serious condition than that described must have resulted. Other cases have come under my observation of comparative immunity after exposure to a very low temperature in a dry atmosphere, and when the body is kept dry. A remarkable contrast must be observed between the two cases here reported. One of a man exposed for a few hours with his feet wet, when the temperature was only a few degrees below the freezing point; and the other exposed for twenty-four hours, with his feet dry, when the thermometer registered below zero, probably, all the time. It is true, there was a difference in the effects, but not at all in comparison with the difference in the extent of the exposure.

This second case is presented to illustrate the secondary condition that follows exposure. In the first we had an active congestion of the surface, but nothing more; in the second, the same primary effect took place, and was soon followed by an effusion under the cuticle. This effusion never occurs immediately. It usually takes place in from twelve to twenty-four hours after the patient has been removed to a milder temperature. The vesicles that follow a mild form of inflammation are filled with a colourless serum, but more or less of the hæmatin of the blood becomes mixed with it as the grade of inflammatory action rises—as when the exposure is for a long time, or to an intense cold. If the parts have become so disorganized as to result in their destruction by moist gangrene, the contents of the vesicles become very dark-coloured. The other condition that existed in this case will be referred to hereafter in reporting a more extensive mortification.

The severe exposure to which Johnson was subjected would, doubtless, have resulted in much more serious injury had it not been for the very rational treatment he adopted in his own case. Those judicious measures prevented general sloughing, if not gangrene, of the whole feet, and kept the inflammation in bounds. Much of the vesicated surface healed without ulceration of the true skin, and where it occurred healthy granulations soon restored the lost surface.

In the first case attention was directed to the good results that followed painting the congested parts with the compound tincture of iodine. So in this case, the merits of the application of a mixture of lime-water and cod-liver oil to the vesicated and ulcerated surfaces is worthy of special notice. The first application was followed by a very marked relief of the burning and smarting sensation, which the patient represented to be very annoying. Its effect in this way was more mechanical than otherwise, by protecting the sensitive parts from the action of the atmosphere; but its virtues as a mild stimulant and emollient are certainly worthy of consideration. The application of the mixture to frozen feet is attended by similar results as the anointing of burns with the celebrated carron ointment. The parts in

the two conditions being so similar, it was decided to apply the carron ointment to the blistered feet in this case; but as no linseed oil could be obtained, and having an abundance of cod-liver oil on hand, the latter was substituted. The effect of the treatment was so highly satisfactory, that I now prefer the improvised ointment to the more popular preparation it was made to imitate. Since adopting this mode of treatment, I learn that it is practised by other surgeons at frontier posts, but have not seen it referred to in any writings on the subject. Their knowledge of its virtues may have been discovered in the same accidental way as by the writer.

CASE III.—Dr. Dunleavy, citizen, *en route* for the Sweet Water Gold Mines near South Pass, passed Fort Bridger in the latter part of December, and, when about fifty miles from the post, lost his way, and remained out for two or three days and nights. The weather was very cold, and the mercury doubtless stood below zero most of the time. The Doctor was warmly clad, and, when not riding about, had the advantage of a fire, and at night slept by one. Knowing the danger to be feared, having spent several years in the Rocky Mountains further north, he was particularly careful to keep his toes in motion as much as possible while riding, though he had on a pair of stout overshoes at the time. Notwithstanding all his precautions the cold was so intense that both feet were, to some extent, frozen when he reached a settlement. The usual phenomena of congestion and vesication presented themselves. As soon as he could communicate with the post, about thirty miles distant, he obtained some tincture of iodine, and painted the feet freely, which afforded speedy relief to the inflammation, except that on the outer edge of one foot. But there, over a space extending from the little toe as far back as the os calcis, and more than an inch in width, was manifested a disposition to slough, notwithstanding the free use of iodine. At first the slough appeared to be very superficial, but as the edges became detached it was discovered to extend deeper in the centre, and separated very slowly notwithstanding constant poulticing. Several weeks elapsed before the whole was removed, and the surface was filled with flabby granulations; healing was accomplished very slowly. The indolent part was dressed with ointment of the oxide of zinc, and the edges touched with a strong solution of nitrate of silver.

Congestion and effusion have already been referred to as consequences of exposure; but in this case the inflammatory action advanced a step further, and extended deeply into the tissues of a part where the circulation was languid, and where there was an abundance of cellular tissue to yield readily to the destructive process. The death of the parts was the result, not of moist gangrene, as sometimes occurs, but of sloughing, wherein the mortification is of a different nature, and a circumscribed eschar results, to be separated by ulceration from the living tissues which surround it. After the exposure had ceased, the part that afterwards sloughed presented no peculiarities as regards appearance or sensation, over other inflamed parts of the same foot; and, under ordinary circumstances, the more remote parts, as the toes, would be expected to yield first to the morbid process; but in this case the capability of resisting inflammatory action

was doubtless attributable to the fact that the circulation had been kept more active in them by the motion of the parts, and the abstraction of heat correspondingly less, so that the toes successfully resisted the morbid process, while the edge of the foot could not. Superficial sloughs are thrown off by a process of ulceration extending under and around the dead part, of the same nature as when it separates a mortified limb, which may be destroyed by complete death. In the cases that have come under my observation, where a superficial part has sloughed from being frozen, the reparative process has not been as active as in healing of an ulcerated surface on the same individual; and such is likewise the case where the continuity of the part has been destroyed by ulceration from the surface downwards, without an eschar. It appears, also, different from the ulcerated surface, separating a part attacked with moist gangrene. The granulations, under such circumstances, as will appear in a case to be reported, are very exuberant, and cover the surface of bones left entirely exposed. In the few cases that have come under my observation the difference may have been accidental, or attributable to some collateral cause, and not the result of any fixed laws in process of reparation.

CASE IV.—John Miller, German, aged years, weighing about 140 pounds; health good; habits temperate; a stage-driver, and for several years in the employ of the Overland Mail Company, started from Fort Bridger, going west with an empty sleigh and six horses on the morning of February 9. The snow on the table-land between the fort and the first station west, was about three feet deep, and badly drifted in places. Miller was all day going a distance of ten miles, and as night came on, finding it impossible to reach the station, or extricate his sleigh from a snow-drift, he turned loose his horses, and started to walk in, leaving his buffalo overshoes in the sleigh. The wind was then very high, and the snow flying so thickly that it was impossible to distinguish landmarks; nevertheless he left the road for a "near cut" to the station. Soon he was lost and bewildered, and it was impossible for him to distinguish the direction to the station, or find the road again. He wandered about in the snow all night. The sleigh was discovered and the man missed, and the next morning search was instituted for him. It was nearly noon before he was found; he had wandered about continuously since he left the sleigh, and was quite stupefied from the cold, and so fatigued as scarcely to be able to walk. When discovered he was in the act of preparing a place to lie down in the snow, where he would unquestionably have slept a fatal sleep. He was brought to Fort Bridger as speedily as possible. On getting into the sleigh to come in, he took a little whiskey offered him, and immediately fell asleep, notwithstanding the constant efforts of the man with him to keep him awake. When he reached the fort at about two o'clock P. M. his breathing was stertorous, his pulse almost imperceptible at the wrist, his body pale and cold, presenting all the appearances of a fatal collapse. The skin about the ankles had adapted its surface to the irregularities of the creases in his boots, and had frozen so that when they were cut off, it looked like the surface of a wash-board. The feet and legs, for two or three inches above the ankles, were frozen as stiff as boards. He was placed on a bed at the end of the ward, where there was no fire, and his feet immersed in

ice-water as he lay there. It was impossible to arouse him; the presence of a liquid in his mouth failed to excite the act of swallowing, so that no stimulant could be administered in that way. Life appeared so nearly extinct that I feared reaction could not be brought about. A sinapism, containing with the mustard some capsicum, was applied to the epigastrium, and the vapour of strong liquor ammoniæ was carefully but freely administered by inhalation. This was continued uninterruptedly for more than two hours, when he was aroused sufficiently to make an effort to swallow. Small doses of whiskey were then administered at short intervals, and his pulse soon beat stronger, and in another hour the stertor ceased, and he breathed naturally, though the sound sleep continued throughout the night, except when he was aroused to take the stimulant and nourishment. His feet were kept in the water until they had become soft, and reaction in them had begun. They were then gently rubbed with oil of turpentine, and enveloped in a woollen cloth, moistened with that liquid. An attendant was kept by him all night, who administered every two hours, alternately, whiskey and beef-tea. In the morning John awoke to consciousness for the first time after going to sleep in the sleigh, and had no knowledge whatever of what had passed for nearly twenty-four hours.

Feb. 11. Feet and ankles red, swollen, and quite sensitive to the touch. Painted them with comp. tinct. of iodine. No vesication yet observed. Ordered nourishing diet and anodynes.

12th. Left foot swollen, painful, and considerably vesicated, particularly about the ankles; swelling slight in right foot and but few vesicles, the appearance indicating that the inflammation will soon end in resolution. Applied dressing of cod-liver oil and lime-water.

17th. Skin of both feet and the vesicles assuming a dark colour, more particularly the right, which promised favourably at first; parts continue sensitive, and no indication of gangrene by crepitus or smell; but sloughing is about to take place; any motion of the feet, as in dressing, gives rise to intense pain, which the patient locates in the ankle-joint; the feet were enveloped in poultices of flaxseed meal with a little cod-liver oil added; anodynes increased.

22d. Slough completely defined above both ankles, and a line of separation formed. Ulceration on the edges shows it to be superficial, extending only through the skin; pain in the ankle-joints continues, and quite intense when the feet are moved to be dressed; appetite poor; losing flesh; ordered two grains citrate of iron and quinia three times a day.

March 1. Slough separating slowly; general health failing. In addition to tonic, ordered beef-tea three times a day between meals.

10th. Slough detaching slowly, and as it progresses downwards towards the ankles, the tissues to a deeper extent are involved, the tendons being exposed, and on one foot both malleoli. Doubtful about being able to save the feet. Ordered, in addition to the stimulants and nourishment previously prescribed, egg-nog and milk-punch, to be taken alternately every three hours.

20th. Having given the patient every chance that the most conservative surgeon would advise, and even to an extent to hazard life by the constitutional depression that has resulted, and the slough continuing to thicken as it progresses downwards so as to involve nearly all the soft tissues of the foot, all hope of saving the feet was abandoned. There are also indications of gangrene about the toes. Amputation was regarded

as imperative to save life, and both feet were taken off an inch above the ankle-joint. The patient stood the operation well under the influence of sulphuric ether.

25th. Doing very well; the greater part of both flaps united by first intention; general condition improving; appetite better; has been taking ale for a few days.

April 12. Stump of left foot where the flaps were entirely covered with skin healed; of the right there had been some ulcerations higher up than the division of the skin, and while the flaps united by first intention, the ulcerated surfaces have not entirely healed, but are cicatrizing rapidly, only a very small space remaining to be covered.

This case is of special interest; it furnishes an example of the vigorous and prolonged, though fruitless efforts of nature, in a healthy subject, to overcome the most serious effects of exposure to cold. At 7 o'clock in the morning, when the driver started, the thermometer stood 4° below zero; at 9 o'clock that night at 1° below, and at seven o'clock the next morning at 1° above. The temperature of the atmosphere at the time of this accident was not so low as that referred to in Case III., nor was the exposure any longer, while the consequences were of a much more serious nature. This is attributable to the following circumstances. The locality of the last accident is proverbially bleak and exposed. The westerly wind sweeps over the plain with great force, and on that day was blowing with unusual violence. The man had the charge of six horses, unaccustomed to the snow, and their management gave him much trouble, so that after labouring with them for nearly twelve hours in going a less number of miles, fatigued and dispirited he had to abandon the team. The mental depression and anxiety therefore acted injuriously. This was more particularly manifested in the constitutional condition that followed; and in Case III. the man kept his feet dry, while in this case the snow being over the boot-tops got into them, was melted by the heat of the body; his socks became saturated with water, and as the cold continued became of such a low temperature as to congeal, and acted as the ready medium of abstracting heat from the parts. Another important consideration was the difference in the temperaments of the two individuals. Johnson had the advantages of the activity of the *sanguine*, while Miller's was very distinctly of the *phlegmatic*.

Attention has already been called to the fact that a portion of the body may be frozen stiff, and remain so for several hours, without resulting in immediate mortification.

We have in this case a repetition of all the conditions reported in previous cases, and to an aggravated extent, together with the addition of a deep-seated inflammation involving the structures of the articulation. The earlier stage, viz., of congestion must have existed for a very short time, as the patient has no recollection of experiencing the burning and smarting sensation complained of by those who suffered from the slighter effects

of exposure. The exsanguine condition followed very speedily because of the readiness with which the heat yielded to the moist cold, and also because of the sluggish circulation characteristic of the temperament. The first unpleasant feeling he noticed was a painfully numb, pricking sensation, and this did not last long, for soon all sensation had ceased, and he was reminded that all was not well only by the stiffness of the parts while walking. The collapsed and frozen condition of the outer surface was followed by a loss of heat from the deeper structures, which was the exciting cause of the inflammatory action that extended to the articulations. This condition was the cause of the pain about the ankles of which he complained at an early day, but at that time it was not suspected to exist. The morbid condition of the surface presented the usual appearance attending synovitis, and at first the inflammation seemed to be so superficial that no apprehensions of deeper-seated trouble were felt. When amputation was performed, it was then apparent that inflammation of the joints had existed for some time. They were filled with a sero-purulent fluid and found to be completely disorganized. With this condition existing it would have been impossible to have saved the feet, and had it been known, an earlier amputation would have been resorted to, and considerable suffering arrested. But a more favourable result had been looked for. When sloughing commenced, the toes and the lower part of the dorsum of the feet were but slightly involved in the morbid process. From these parts the cuticle soon separated, leaving an inflamed cutis looking very much as if it would recover without the loss of structure, but higher up around the ankle-joints and over the heels, the true skin was destroyed. At first the slough was supposed to be confined to the skin, but as it became detached, it continued to extend deeper and deeper until there were indications of the morbid action reaching the vessels that passed through the eschar and obliterated their calibre; for on the day the amputation was performed, the parts below that had promised so favourably, exhibited signs of moist gangrene, when nothing of the kind existed elsewhere. Obstruction of the circulation and not inflammatory action was the cause, and in another day in all probability the whole feet would have been gangrenous. After the removal of the feet, incision in the slough demonstrated that it extended through the entire soft parts.

No other portion of the body was injured save one of the fingers, which had a slight frost-bite on it.

The man was very warmly clad, having on at the time he was exposed two pairs of heavy cloth pants, and a very stout overcoat, with a shawl wrapped about his neck and face as high up as his eyes. He had taken every precaution, as stage-drivers generally do in this severe climate, to protect himself against cold, and if he had remained in his sleigh, and kept on his buffalo-skin overshoes, with the aid of his robes he would have

suffered no inconvenience, as assistance reached his abandoned sleigh only a few hours after he left it.

CASE V.—John Lewis, very stout framed, over six feet, about 30 years of age, sanguineo-bilious temperament; health good. Started, in company with another man, at three o'clock in the afternoon of January 1st, in the midst of a severe snow-storm, from a stage station fifty miles west of Fort Bridger, to walk to the next station, ten miles distant. They were soon lost; but pressed onward until two o'clock the next morning, when they reached Bear River, and finding a place somewhat protected from the storm by the willows growing on the banks of the stream, they remained there until daylight, pacing up and down on the ice, most of the time, to keep warm. Occasionally they suffered from cold feet, but a little exercise soon made them comfortable again. At daylight they undertook to retrace their steps; but made slow progress—wind blowing very hard, and driving the falling and drifting snow directly in their faces. After advancing a short distance they would have to turn their backs to the storm and rest. Early in the day Lewis' companion became exhausted from cold and fatigue, and finally froze to death, as will appear in report of Case VI. During the day Lewis experienced no great inconvenience from cold feet; but as night came on he again sought a sheltered spot, and after halting a few minutes felt a numbness of his feet; soon all sensation left them, and they appeared as dead weights. He spent the night there, sleeping occasionally for a few minutes, but soon to be awakened by the cold, for he had no blankets; he would then walk, and stamp about to warm himself again. He resumed his travels at daylight, it then being the third day. About noon, when crossing a creek, the ice broke, and he went into the water above his knees, which produced a warm and grateful sensation, and he thought he could walk with more ease afterwards. The snow was two feet deep, and as his feet sank through it afforded some support to his legs as he put his weight on them in walking. This he distinctly noticed when he reached a road, for then he had less control over the motions of his lower extremities and staggered from side to side. Before reaching the road he was nearly exhausted from cold, hunger, and fatigue, and felt, for the first time, like giving up in despair. Just then he observed telegraph poles a short distance ahead, which inspired him with new life and energy, and a walk of a few hundred yards brought him to a cabin. He was so completely exhausted when he reached the door, that before it could be opened he fell heavily against it. When taken in he was unable to articulate, and felt very faint; but a cup of some warm aromatic infusion soon revived him. He had eaten nothing whatever for nearly three days. His boots and socks were cut off; his feet were white, shrivelled, and frozen stiff. A tub of cold water was provided into which they were immersed all night, and the next morning were enveloped in a poultice of boiled onions. When the poultice was removed the following day the whole surface of both feet was covered with vesicles. A poultice of cow manure was then applied, and renewed from day to day, for five days.

He was then taken to a station ten miles distant, when the domestic practice was changed, and a dressing of coal oil applied, and on the next day one of crude petroleum. The oil dressing caused intense pain in the feet, though they had already begun to mortify, as he described them as turning a mottled blue colour, and emitting an offensive smell.

Jan. 10. The man was to-day brought to Fort Bridger, when I saw
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him for the first time. The above account of his case was then obtained from himself. Both feet are gangrenous, but no distinct line of demarcation is yet observed. Applied flaxseed poultices mixed with Labarraque's solution. Administered anodynes, and put him on a nourishing diet.

15th. Lines of demarcation distinctly formed on both feet, and the living and dead parts begin to separate. On one foot this occurs about the tarso-metatarsal articulation, and on the other nearly as high up as the ankle. Amputation was performed directly at the line of demarcation in both feet, separating the metatarsal bones at their articulation in one, and in the other disarticulating as in Chopart's operation. No covering for the bones was obtained in either foot. In the disarticulation of the cuboid and scaphoid from the astragalus and os calcis a partial covering of the muscles was obtained, but in the other the whole articulating surface of the tarsus was entirely uncovered. The patient was under the influence of sulphuric ether during the operation, and appeared quite comfortable after its completion.

I will take occasion, here, to say that in this, and in all the surgical operations I have performed at Fort Bridger, I have obtained valuable assistance from Dr. J. Van A. Carter, who has always manifested a willingness to aid me which I have appreciated, and think worthy of high commendation.

18th. Doing remarkably well. Healthy pus forming on the surface and granulations already appearing. Considerable sloughs around the ankles and heels, exposing the end of one os calcis. Simple dressings to the stumps, and ointment of oxide of zinc to the ulcerated surfaces.

Feb. 1. Ulcerated surfaces nearly healed. Piece of the os calcis necrosed, and came away. Stump granulating rather exuberantly, and is touched occasionally with nitrate of silver. The ends of all the exposed bones being rapidly covered with soft tissues granulating around them. General health very good, and patient growing fat.

April 12. Right foot entirely cicatrized; all the ulcers on the left healed, leaving a surface of less than an inch in diameter of the stump to be covered with skin.

During the three days this man was exposed to the weather the thermometer at Fort Bridger ranged from 18° to 36° above zero. The locality where the accident occurred is always much colder than at the post, and must, necessarily, have been many degrees so, on this occasion, to have produced such results. To ascertain the real temperature is impossible, there being no thermometers in that locality. It cannot be decided what would have been the result in this case had a more judicious treatment been adopted in the first instance. The warm emollient applications would facilitate the unfavourable termination that was experienced; but it must be remembered that the feet were in a frozen condition to a greater or less extent for nearly twenty-four hours, when he reached a place of shelter. However, that mortification did not occur for several days is highly probable, and as the parts evidently were not injured to the same extent as in Case IV., and the man a better subject for resisting such an unfavourable termination, a proper treatment of the inflammation *might* have saved the feet.

The ulcerations about the ankles and heels granulated and cicatrized

rapidly. These parts, in some places, were destroyed entirely through the skin and cellular tissue; but the ulceration was from the surface downwards, except in one spot over the back part of the heel, where sphacelus occurred, and a piece of the end of the os calcis necrosed and separated.

A point to which attention is particularly directed is the very rapid and healthy granulation and cicatrization, over a large surface, after the removal of the feet. Considering the great value of the heels, and a portion of one foot, to a poor man, who might not be able to provide the most improved artificial means to aid him in walking, every part that could be left was allowed to remain. After the incisions were made, and the parts removed, I must admit that the great extent of exposed surface, without the possibility of obtaining a skin covering, and with the articulating ends of the bones prominent, tempted me to perform a higher amputation at the time. It was decided, however, to give the patient the benefit of the chance, and let the stumps remain as they were. The result has shown the prudence of the practice, for the entire ends of the bones have been thickly covered with granulations of the surrounding soft parts, and at the date of this writing a space not larger than a twenty-five cent piece remains to cicatrize.

CASE VI.—Van Wood, a citizen formerly employed by the Overland Stage Company, started with Lewis, as reported in Case V., to walk to an adjacent station during the prevalence of a severe snow-storm. Their experience for about eighteen hours has already been related.

Van Wood is described by his companion as a man of rather small stature, weighing about 140 pounds. He was without employment or means, travelling through the country seeking some way of obtaining a livelihood. His clothing was scant for so cold a climate, and his subsistence doubtless had also been limited. During the night the two men were together, Van Wood did not appear to suffer much more than his companion from the cold (and neither of them suffered to a great extent); but before they had advanced far the next day he complained of numbness of his body and extremities, and could walk only a very short distance without being compelled to stop and rest. When he stopped he became very drowsy, and after a short time fell asleep at each halt, and his companion had to awaken him to start again. At first he was aroused without difficulty, but always expressed a desire to stop longer. He early gave way to despair, saying his "time had come," and advised his companion to abandon him to his fate, and save himself. By this time he had to be beaten and jerked about with considerable rudeness to keep him awake, or to arouse him when he fell asleep. Soon he lost the control of his limbs, and was unable to walk, when his companion, a stout man, carried him on his shoulder a distance of three miles. He invariably fell asleep as soon as he was put down, and finally slept soundly as he lay on his companion's shoulder. When awake, he fully realized his desperate situation, and frequently insisted on being abandoned. His appearance had become very cadaverous, and as the day was waning, and the danger of both perishing becoming imminent, his companion, realizing the importance of making every exertion to save himself, left the man in a spot as protected from the storm as he could find, and pressed forward alone, hoping to find assistance and return.

Van Wood, when abandoned, is described by his companion as "looking as white as a sheet, and his eyes turning green"—a deception probably occasioned by a contrast between the colour of his iris and his pale skin, which had not been observed before. Before leaving him, he was aroused by rubbing snow on his face and other rough treatment, but vitality had so far left him that he could speak with difficulty, and only in a low whisper.

This case presents an example of a man perishing from the effects of cold and fatigue combined. The tendency to sleep that existed had not extended to that profound coma which precedes freezing to death, for it appears that he could be aroused, though with considerable difficulty, when vitality had nearly ceased. This is remarkably in contrast with Case IV. Concerning his respiration and the circulation nothing definite could be ascertained. His companion does not remember any marked stertor, though it may have existed to some extent. Congestion of some of the vital organs must have occurred, though probably to a very inconsiderable extent, in the brain. As the surface of the body had been observed to be cold and collapsed for several hours, it is quite possible that for a much longer time the skin had ceased excreting effete matters, that the blood had become overcharged with noxious materials, and, circulating through the brain in that condition, had exerted its narcotic and poisonous influences, tending to coma. There may also have been congestion both in the brain and all the splanchnic cavities, occasioning death by a combination of asthenia with apnoea.

This case is also one of interest as demonstrating the difference, in individuals of different temperaments and constitutions, in resisting morbid influences. Lewis is a man combining the characteristics of the sanguine and bilious temperaments, and of a good constitution, that has not been abused by excesses, although he has been subjected to hardships and privations. Van Wood is described as having the very opposite peculiarities. He was of a distinctly-marked phlegmatic temperament, with a poor constitution, more the result of irregularities of life and exposure than natural weakness. The latter, after an exposure of less than twenty-four hours, sank under the depressing influences he encountered, while the former, exposed to the same, had lost none of his physical vigour, as demonstrated in carrying his companion on his shoulder, in a severe storm and through deep snow, a distance of three miles. After abandoning him, he continued exposed to the same severe weather for more than twenty-four hours longer, without shelter except from an occasional growth of stunted bushes, and without food. There is also to be observed as great a difference in their mental constitutions as in their physical. The one was given to despondency and lack of energy, the other was hopeful and determined. His nervous energy operated in sustaining his physical strength; and when the high degree of tension which had characterized it, without any physical means of aiding it, had relaxed, the physical powers sank rapidly, and as soon as he obtained succor he was unable either to stand or to speak.

ART. IV.—*Acute Atrophy of the Liver, illustrated by Cases ; with some Remarks upon the Similarity between this Disease and the Effects of Poisoning by Phosphorus.* By JOHN HOMANS, M. D., of Boston, Mass.

HAVING lately made an examination of the body of a person dead of acute atrophy of the liver, it has appeared to me that an account of the case and of the autopsy would be interesting. To this I have added notices of nineteen others, making twenty, of which but three are here published for the first time, and only five are American, though I doubt not that the records of every large hospital in the United States would furnish one or more examples of this disease. The following cases, with one exception, have appeared since the publication of Frerichs' very able work on the diseases of the liver. This number of cases, grouped together and added to the thirty-one on which Frerichs generalized, will be valuable in assisting us in determining the average duration of the disease; which sex is most liable to it; its most constant symptoms, and most usual post-mortem appearances. While the etiology of a disease is undetermined, it frequently happens that observers record cases, without the design of misleading, which tend to sustain their own theories; so that some physicians, believing that acute atrophy of the liver is a disease of pregnancy, will naturally collect cases occurring in pregnant females, and be more careful in making autopsies in such cases. It seems supererogatory to describe acute atrophy of the liver when such a perfect account of it is to be found in Frerichs' exhaustive article on this malady, yet I cannot but think that this collection of cases, taken in connection with what the German author above mentioned has written on the subject, will prove valuable.

CASE I.—This case, in which the atrophy of the liver was so extreme, occurred in the practice of Dr. C. C. HOLMES, of Milton, Mass., and we are indebted to him for the following account of it:—

Mrs. F., 28 years old, has borne two children. Her weight is 165 pounds. She has had occasional attacks of nausea and indigestion during the last three months of her life, but has considered herself well until four weeks ago, when she was seized with severe pain at the epigastrium, extending to the right hypochondrium. This attack was relieved by a cathartic and opiate. October 4th, 1867, Dr. Holmes was summoned, and found Mrs. F. partially dressed lying upon a couch; she had severe pain at the epigastrium extending to the right hypochondrium. Pulse 120, hard and strong; skin hot and dry; tongue somewhat coated. She had taken a mild cathartic, and was given morphia till the pain was relieved. On the evening of October the 11th the whole skin was yellow, and on the 12th the mind was wandering; she also vomited occasionally, though nothing unusual was noticed in regard to the character of the vomited matters. She took calomel and Dover's powder, of each six grains, and in the night passed free yellow discharges, which, as well as the urine, were involuntary. On the morning of the 14th she was violently delirious, throwing herself about, and spitting at her attendants, four of whom were

required to keep her in bed. She took one-quarter of a grain of sulph. of morphia; in about an hour the delirium subsided into coma; the pupils were not dilated. This state lasted for thirty hours, when she died. No petechiæ were observed; no convulsions occurred. From the time of the appearance of serious symptoms the urine dribbled away so as to keep the bladder empty, and prevent the chance of obtaining a specimen for examination.

I made the *autopsy* on October 18th, three days after death. Body tall and stout; skin jaundiced.

Head: Brain.—Septum lucidum quite soft; each choroid plexus contained a cyst the size of a dried white bean. Brain in other respects normal.

Thorax.—Contents normal.

Abdomen.—About twenty ounces of reddish-brown fluid in abdominal cavity. Stomach, spleen, kidneys, and genital organs normal. Uterus unimpregnated.

Liver.—Lies “tumbled down,” as it were, against the spine and ribs, very flaccid. Weight, with gall-bladder and contents, twenty-two and a half ounces. Proportion of weight of liver to that of body as 1 to 117.33. Average normal proportion in a healthy woman of 28, as 1 to 36; so that this liver is reduced to less than one-third its normal size and weight. The capsule is in some places transparent, and in others dusky-looking; over the under surface of the left lobe it is especially opaque and shrivelled. The parenchyma is flabby, and can be folded and rolled into various shapes almost as easily as a piece of wet wash-leather. The edges of the organ are sharp and thin, especially in the left lobe, which is about an inch in thickness, and as limp as a piece of wet cloth. As before stated, the capsule of the left lobe is opaque, and the peculiar appearances, seen through this membrane elsewhere, can only be discerned with difficulty at two or three points. Through the capsule covering the right lobe are seen spots rather prominent, of a deep-yellow colour like that of rhubarb, and of variable size. On section these masses are found infiltrated throughout the organ, and the colour appears more distinct and of a deeper yellow than when seen through the capsule; in a very few places the tissues around these deposits are of a purplish-red colour. These masses are much more abundant in the right lobe than in the left, the former being, as one might say, filled and infiltrated with this yellow deposit, while the latter contains only three or four masses. The portion of the liver not occupied by this yellow material resembles *in colour* the cortical substance of a rather pale kidney, or the tissue of a compressed lung, and has but little resemblance to normal liver structure. The bloodvessels of the liver are empty, save that in some of the hepatic veins brownish, non-crystalline concretions are found. The gall-bladder contains one ounce and a half of thick, brownish bile.

The *microscopic* character of the *yellow* portions is as follows: 1st, the presence of very many oil globules of every size; 2d, not a single blood globule is seen; 3d, the presence of pale liver cells, and liver cells filled with yellow debris; many of these cells are shrunken and misshapen; 4th, the presence of many masses of yellow, brownish-yellow, or golden-yellow colour, generally globular. Of the *non-yellow*: 1st, great numbers of oil globules, much granular matter and debris; 2d, the general absence of liver cells; 3d, the general absence of blood globules; 4th, great numbers of fibres of areolar tissue, and walls of bloodvessels and ducts. As the

yellow masses are much more abundant in the right lobe than in the left, and as the non-yellow left lobe contains almost no liver cells (only *one very pale cell* was seen in daily examinations lasting for weeks), and as the yellow portions of the right lobe contain cells, distorted and filled with yellow debris it is true, I am of opinion that the portions of the liver, described above as resembling compressed lung, are in a more advanced state of atrophy than the yellow portions; it has lost entirely its secretive machinery, and is converted into a mass of areolar and connective tissue. Half of the liver was taken and cut into small pieces and triturated with water, it was afterwards boiled, and from the filtered solution many crystalline bodies, which I suppose to be crystals of leucine, separated. These crystals resembled exactly some of the forms of leucine figured by Frerichs. No needle-shaped crystals of tyrosine were deposited.

In this case the patient was attacked with pain at the epigastrium extending to the right hypochondrium, four weeks before her death. This may fairly be called a premonitory symptom, though it did not continue, and seemed a temporary affair, yet the locality was the same first complained of in her fatal seizure, and although it cannot be settled that the attack of pain was not caused by undigested food, still it seems most probable that at that date the atrophy of the liver was progressing. Of the thirty-one cases of acute atrophy of the liver collected by Frerichs (probably all that he could find mentioned, as he cites English, French, and German sources of information), the premonitory symptoms¹ "were described in one-half the cases, and usually consisted of those derangements which are met with in acute catarrh of the stomach and bowels. . . . In most cases the duration of these premonitory symptoms amounted to from three to five days; but in many cases to from two to three weeks and upwards." According to the same author quoted above, the skin was invariably jaundiced. "In the advanced stages of the disease . . . petechiæ and large ecchymoses of a reddish-brown or black hue became developed." In Dr. Holmes' case the skin became jaundiced, but no petechiæ were developed. Hemorrhages taking place simultaneously from various parts of the body were observed in one-half the cases recounted by Frerichs; in the present case there was an absence of hemorrhagic symptoms. Respiration is unaffected save in the last stage. In one of the following cases the respiration was affected throughout, but may have been a complication and not one of the integral symptoms of the disease.

"The organs of digestion always undergo important functional changes. The premonitory symptoms usually are ushered in by gastric derangements, loss of appetite, oppression at the præcordium, nausea, furred tongue, constipation, &c.; when there is no premonitory stage, these symptoms usually make their appearance on the outbreak of the jaundice. Among the most important symptoms belonging to this group may be mentioned, in the first place, abdominal pains, which were observed in three-fourths of the cases. They are situated sometimes in the epigastrium; at other times, and most frequently, in the hypochondria, especially the right, corresponding to the region of the liver."²

¹ Frerichs on Diseases of the Liver. Sydenham Soc. Trans., vol. i. p. 217.

² Ibid., p. 219.

The above description agrees well with the report of Dr. Holmes.

"The results of percussion are of much greater diagnostic importance than the pain, which in many cases is completely absent. Percussion shows a rapid diminution in the volume of the liver, commencing with the left lobe and extending towards the right. Usually the hepatic dulness soon disappears entirely, because the organ, constantly becoming softer, owing to the disease of its tissue, collapses, and is pushed towards the vertebral column by the intestines distended with gas. In the same proportion as the liver is atrophied the spleen is enlarged, and is the seat of tenderness on pressure in the left hypochondrium."¹

Percussion was not attempted in this case, so that the record of diminishing dulness over the region of the liver is wanting. During the acute delirium it could not have been accomplished, and after coma came on, it seemed useless. At the autopsy the spleen was not found to be enlarged, nor is it recorded as having been of large size in the majority of the following cases.

Vomiting, at first of gray mucus, and occasionally of bilious matter, but afterwards of grayish-brown or black grumous fluid, coloured by the hemorrhage into the stomach, is another symptom usually present according to Frerichs. The cases I have collected confirm the general presence of this symptom. According to the same author, the urine is usually secreted in normal quantity, "but in the more advanced stages of the affection it has been necessary to draw it off by the catheter for the purpose of examination; otherwise it has passed off involuntarily."² He found it, however, to be altered in character. The urea and phosphate of lime gradually disappeared, and a greenish-yellow deposit, consisting of crystals of leucine and tyrosine was found, after the urine had been standing in a cold atmosphere. In this case no urine was obtained for analysis. In some of the subsequent cases chemical and microscopical analyses of the urine will be given. Affections of the nervous system have invariably been present as essential characteristic symptoms.

"The nervous derangements are ushered in with severe headache, accompanied by a gloomy, irritable temper, and restlessness. These symptoms are soon followed by delirium, which is usually noisy, and raging, but occasionally shows itself in the form of quiet, harmless wandering. The patients throw themselves about in a restless manner, moan loudly, and from time to time utter an inarticulate cry; not unfrequently they fall into maniacal paroxysms. . . . Towards the termination of the disease the delirium and convulsions, as a general rule, have given place to stupor, which in a short time has merged into the deepest coma, from which no shouting nor shaking could rouse the patient. The character of the pupils has been by no means constant; in many cases they remained of normal size, and reacted with light, as in my own observations and in those of Frey, &c.; in others again they were dilated and immovable, and in very rare instances contracted."³

These nervous symptoms, with the exception of convulsions, formed most striking characteristics of the case described at the beginning of this article; the restlessness and delirium were violent, and the coma corre-

¹ Frerichs on Diseases of the Liver. Sydenham Soc. Trans., vol. i. p. 220.

² Ibid., p. 220.

³ Ibid., p. 221.

spondingly profound. The pupils were not dilated nor in any way remarkable. "After the commencement of the characteristic symptoms, the disease almost invariably terminates in five days, and sometimes even in from twelve to thirty-six hours."¹ In this case the disease ended in *four days* from the time the attending physician was called; the period of stupor and coma lasting thirty-six hours. But the whole period during which the disease was progressing was probably four weeks, and perhaps longer. The anatomical lesions correspond with those enumerated by Prof. Frerichs, except that the liver was more atrophied than in any of the cases he describes or mentions. I believe, as I before said, that the atrophy was more complete in the left lobe, where there was little yellow material, than in the right; because I could not discover liver cells in the former, while in the latter I was generally able to find them filled with yellow contents, and in many instances distorted. I regret not bringing away one of the kidneys for microscopic examination, but as they appeared sufficiently healthy they were replaced in the body.

CASE II.—Milly A. M., coloured, æt. 35, widow, domestic, born in North Carolina, entered the Massachusetts General Hospital April 12th, 1859, and was under the care of the late Dr. Augustus A. Gould. The following account of the case is copied from the records of the Massachusetts General Hospital: "A coloured woman, formerly of Wilmington, N. C., where she was a slave. Left Wilmington five years since. Mother of one child. Has had intermittent fever several times, but little or no other sickness previously to present, which commenced a week ago to-day with a chill immediately followed by pain in head and limbs. From that time forth has had a continuance of headache; a feeling of exhaustion; a hard, dry cough, attended with pain at lower sternal region; considerable dyspnœa; anorexia; thirst; restless nights. Day before yesterday another chill; kept at work till yesterday at noon, and since that time has kept her bed.

Now in bed, reclining on right side and back. Says she cannot lie on her left side on account of pain. General appearance of prostration. Skin hot and dry; pulse 130, very small and feeble; dyspnœa; respirations 28; tongue thickly coated with prominent red papillæ. Is much exhausted by speaking. Complains of pain at lower end of sternum as being constant. Occasional pain in right hypochondrium. Sore-throat for several days. Says she has expectorated some "phlegm," but not tinged with blood. Bowels sufficiently open. R.—Pulv. ipecac et opii, gr. x. April 13th. Slept better than before. General history as yesterday. Breathing hurried. On percussion dulness over lower right chest, front and back, with diminution of murmur. No crepitus detected. Complains of pressure on surface" [I suppose surface of lower right chest.] "Passed no urine since entrance. Hot fomentations to hypogastrium, and catheter if necessary. R.—Ant. et potass. tart. gr. ij; aquæ fontanæ, ℥ijss.—M. A teaspoonful every two hours. Liquid farinaceous diet. April 14th. Vomited medicine till dose reduced one-half; also other ingesta. Quite delirious. Got a Dover's powder at night. Relief by catheter only. This morning, tongue red and dry; pulse 126; skin dry and sensitive; no cough or expectoration; no

¹ Ibid., p. 223.

dejection. Jaundice of conjunctivæ; omit present medicine. R.—Mist. febrilis, ʒj every four hours. Cream of tartar water to drink. April 15th. Vomiting and delirium continued, the former somewhat relieved by opiate at night; urine the same; conjunctivæ more deeply coloured; pulse 104, and small; right hand swollen and very tender; abdomen tympanitic; no dejection; some cough; murmur, and resonance somewhat obscured over upper right front. Omit medicine of yesterday. R.—Hydrarg. submur. gr. j, in mucilage every six hours. Mucilaginous drinks. April 16th. Rather less delirium; had a better night; one dejection; pulse 112; skin quite moist, not clammy; coughs rather more painfully; breathing accelerated, performed with a jerk; resonance and murmur natural in front. Back not examined. One dejection. R.—Spts. vini gallici, ʒj every three hours. Continued about the same as at visit, till two o'clock P. M., when suddenly alarming symptoms set in, and in ten minutes she was dead."

The following autopsy is from the record made by Dr. CALVIN ELLIS:—

"*Brain*.—Membranes of the brain decidedly yellow; serum of the same colour exuded from the substance of the organ itself. Otherwise nothing remarkable.

"*Lungs*.—Irregular portions of the pleura, covering the posterior part of the upper lobe of the right lung, were of a yellow or greenish-yellow colour. Contiguous portions of the surface of the middle and lower lobes, to a limited extent, were similarly affected, and slightly adherent. The lung below was of a red or dark-olive colour, quite offensive, as in gangrene, but not friable. On pressure there escaped only bloody serum. Several distinct limited portions, upwards of an inch in diameter, were thus changed, an irregular, yellowish line separating them from the surrounding pulmonary tissue.

"On *microscopic* examination the usual amount of healthy epithelium was not seen; but perhaps fragments of the same. No evidence of inflammation; many small ecchymoses in the pleura covering the posterior part of each lung. Lungs in other respects normal.

"*Heart*.—Normal. Some recently coagulated fibrin within the cavities. Blood generally liquid. Peritoneum.—Omentum adherent to the fundus of the uterus and right side of anterior parietes. Limited old adhesions between the diaphragm and liver. *Liver*.—Quite flaccid and of a yellow colour. Several portions of the right lobe, from a quarter to half an inch in diameter, were quite soft, and the largest of a red colour. On *microscopic* examination, however, all parts presented the same appearance, viz., a granular opaque condition of the hepatic cells, some of which contained more fat than usual, and were deformed. Although the cells were not as much changed and broken as in well-marked cases of 'acute yellow atrophy,' yet the change resembled that seen in the latter disease, the difference being one of degree. Bile ducts all pervious; bile dark coloured." The weight is not recorded, but Dr. Ellis informs me that he remembers the case well, and that the liver was very much reduced in size. "*Spleen*.—Soft, pulp easily washed out. *Kidneys*.—Very flaccid; weight, seven and seven and a half ounces respectively. Portions of the cortical substance were removed with the capsule, evidently owing to softening. The tissue had a yellow tinge which contrasted strongly with the vascular points. On *microscopic* examination the tubuli of the cortical substance were found filled with granular matter, and the free cells were granular and broken. The tubuli and epithelium of the cones appeared healthy. *Uterus*.—Of large size, but firm. Appendages adherent to it. *Stomach*.—A portion

of the mucous membrane in the large extremity, more than an inch in diameter, was surrounded by an irregular blackish hue, and on immersion in water appeared smoother than the remainder, but the microscope showed no difference. Other organs not remarkable, though stained by bile, when the natural colour allowed the change to be seen."

In the above case the premonitory symptoms began eleven days before death with a chill. Jaundice was first noticed on the 14th of April, nine days from the first premonitory symptom, and two days before death. On the same day she vomited after taking one-tenth grain of tartrate of antimony and potassa, but the vomiting continued after the medicine was omitted. On the next day her right hand was swollen and tender; no further mention is made of this symptom, nor is the condition of the hand at the autopsy described. The pulse was rapid throughout. The respiration was considerably affected, being often quickened and accompanied by dyspnoea. The organs of digestion were affected: anorexia, thirst, thickly coated tongue, pain at lower sternal region and right hypochondrium. No results of percussion over the region of the liver are recorded. The urine began to be retained on the 13th, eight days from the first symptom, and three days before death. In regard to the affection of the nervous system, the period of excitement was well marked, beginning on the ninth day of the disease, and the second before death. The period of depression was very short, lasting probably not more than a few hours, and no deep coma, such as is usually observed, is recorded. The nervous symptoms and jaundice appeared simultaneously. The duration of the disease, from the first premonitory symptom, was eleven days; from the first appearance of any symptom which could be called characteristic, three days. The anatomical lesions may be considered well marked. There was more serosity of the brain than usual. Portions of the right lung appear to have been in an incipient stage of gangrene; there were many small ecchymoses in the pleura covering the posterior portions of both lungs. In the heart the blood was generally fluid. The liver was reduced in size, quite flaccid, and of a yellow colour; the cells were broken and deformed, and filled with oil globules. The kidneys were in a state of granular degeneration. No crystals of tyrosine were noticed. "The extravasations of blood in various organs and tissues are also remarkable. These were seen in the larger number of cases . . . they were also observed in the retro-peritoneal areolar tissue, and beneath the pleuræ and epicardium."

CASE III.—For the history of the following case, I am under obligations to Dr. JOHN P. REYNOLDS, who allowed me to copy his record from the books of the Boston City Hospital. Dr. CHARLES W. SWAN, Pathologist to the Boston City Hospital, very kindly gave me a copy of the post-mortem appearances.

"Onla H., æt. 32 (male), native of Norway, single, mariner entered the

¹ Frerichs on Diseases of the Liver. Sydenham Soc. Trans., vol. i. p. 226.

City Hospital September 14th, 1866. Four weeks since was overworked in a heavy gale while at sea. The following symptoms then appeared: Nausea and vomiting; loss of appetite; thirst; bowels constipated; chills and sweating; headache; pain in calves, thighs, and arms; epistaxis; bitter taste in mouth; excessive secretion of saliva. Urine was of the colour of tar-water, no pain on micturition. Feces light coloured. Such was the state of affairs for two weeks, during which time the patient did not keep to his bed, but took his turn at the wheel. At the end of this time first noticed yellowness of skin" (*i. e.*, two weeks from first symptom of illness, thirty days before death). "The patient now improved, the bowels became free, the urine less highly coloured, and, in fact, all the symptoms became less and less urgent. A week after" (*i. e.*, a week before entrance) "he ate green apples, and diarrhœa ensued, soreness of abdomen extending from right lumbar region out over the upper part of abdomen, embracing lower portion of chest. He had no chills, but considerable pyrexia, headache, sweating at night, nausea and vomiting, bitter taste, &c. These have continued to present time, with exception of diarrhœa. Expression somewhat heavy, skin and eyes very yellow, tongue has a pasty yellow coat, some sordes at base of teeth. Salivary secretion very yellow and profuse, at times mixed with blood; pulse 60, full and steady, but weak; bowels regular, discharges clay-coloured; urine very dark, diminished in amount; no difficulty in micturition; beef tea. R.—Pulv. ipec. comp. gr. x. h. s.

"15th. Beef-tea twice a day; tea and toast morning and evening; lemonade with potass. bitart. to drink. Pulv. Doveri at night, if necessary.

"16th. Slept poorly, though Dover's powder was administered; vomited freely at bedtime, once this morning. One solid clay-coloured dejection this morning; pain as yesterday, perhaps not quite so severe; tongue more clear; pulse 50, small, regular; reports taking food with relish. An analysis of urine resulted thus: Acid, dark brown; odour normal; spec. grav. 1014. Very large mucous sediment, nearly filling the glass containing the specimen. Urophæine somewhat increased; uroxanthine normal; phosphates normal; sulphates and chlorides likewise; urea diminished; no albumen, blood, pus, or sugar was found; biliary matter present. By the microscope crystals of uric acid containing a large amount of greenish colouring matter.

"17th. Pulse 80, weak; great restlessness.

"18th. Passed a restless night, but with intervals of sleep. Has vomited at regular intervals large amounts; large quantity of urine drawn with catheter, and found deeply tinged with bile. R.—Spts. vini gallici, ʒj every four hours, by the rectum.

"19th. Urine free; less vomiting, and less annoyance from tenacious sputa; three injections of beef-tea retained.

"20th. Pulse 48, regular, feeble, characteristic of the disease; responds slowly when addressed; lies in a quiet half-stupid condition day and night; skin intensely yellow; no vomiting; wine-why.

"21st. Pulse 72; tongue not very much coated; no restlessness or delirium; pupils very much dilated; roused with difficulty; retained chicken-tea and wine-why.

"22d. More restless; many loose dejections; noticed no vomiting; retained food; tongue more clean; sordes on teeth; yellowness of face less marked; pulse 56; extremities cool.

"23d. Pulse 56, rather weak; breath offensive; tongue and lips

covered with bloody serum; skin less intensely yellow on face and trunk; urine and dejection passed involuntarily; no fecal matter. Speaks for the first time for three days.

"24th. Comfortable; no nausea; some bleeding from mouth; no dejection; urine passed involuntarily; some improvement in mind; though still far from having perfect control of his powers; pulse 64.

"28th. One large black dejection" (probably from hemorrhage into stomach or bowels). "Vomited for first time in several days, *ejecting a bloody coagulum*. Has been stupid for past three days, incapable of being roused.

"30th. Patient comatose and rapidly sinking; at 3 P. M. died."

Dr. CHARLES W. SWAN's account of the *autopsy*. "City Hospital. Autopsy of Onla H., October 1st, 1866. Body well developed; no emaciation; everywhere a strong deep yellow hue of skin; considerable rigor; lungs healthy, *excepting an apoplectic nodule*, size of an English walnut, in the right lung; *pleuræ* on both sides firmly adherent; *heart* nearly empty; *liver* decidedly small, weighing one and three-quarter pounds (28 oz.). Amount of normal tissue small; both lobes, more generally the right, invaded by a lobuloid dull olive-yellow deposit, which in its minute structure seemed to occupy, and make prominent to the sight the individual acini, but so generally as to produce a continuous discoloration, excepting at the outer limits, and a few interstitial portions, where the outline became one of glandular arborescence. The anterior edge of right lobe and upper surface towards the suspensory ligament, together with the greater portion of the left lobe, were comparatively free from the disease, and of a normal appearance. The disease though extensive, was central, rather than peripheral. *Gall-bladder* contained a medium amount of dark, viscid bile, and two small calculi, one-eighth and one-quarter inch in diameter, made up of small granules having a rough surface, and a colour partly yellow, partly greenish-black. Biliary ducts pervious and discoloured by bile. *Stomach and intestines* contained considerable thick black fluid, probably altered blood. No hemorrhage spots or appearances of vascularity in the former; but the latter were externally dotted over with hemorrhagic blotches, still more distinct within, in the course of the minute transverse vessels, particularly at their extremities. Similar effusions occurred in the mesentery and mesocolon, but rarely in the large intestine itself; in the vicinity of the pelvis of the right kidney, and in the left pectoral muscles. Trunk and extremities marked with purplish blotches, generally though not always appearing to be hypostatic. Some of those on the extremities were delicately shaded into the surrounding portions of skin, and had a decidedly purpuric appearance. *Spleen* normal, of medium size and consistency. *Kidneys* not remarkable. *Bladder* contained a few ounces of rather turbid urine, discoloured by bile." *Microscopic* examination of the liver by Dr. C. ELLIS, who exhibited the specimen to the microscope class at the medical college, showed thorough disorganization of the liver. A drawing of the appearances has been kindly given me by Mr. H. P. Bowditch. Numerous oil globules are seen, many granules stained with colouring matter, and a *very few* small shrunken pale liver cells.

This is a well-marked case of acute atrophy of the liver, though of long duration, the disease lasting six weeks and two days, and being characterized by occasional amelioration of the symptoms. What might be called

premonitory symptoms, that is, symptoms which might be accounted for by simple jaundice, lasted thirty-one days, when in addition to his other symptoms he had retention of urine. Jaundice was noticed thirty days before death. The pulse continued slow, ranging from 50 to 60, until the 17th, when it rose to 80, but on the 20th fell to 48, and so it continued, being for the most part slow.

"Not until the abnormal nervous symptoms become prominent does the rapidity of the pulse begin to increase, and it then rises from 50 or 60 to 90 or 100, or upwards. Remarkable variations in its frequency are at times observable; for a brief period it rises to 100, 120, 130, soon afterwards to fall again to 80 or 90 . . . not until incipient cerebral paralysis supervenes does the increased frequency continue of a uniform character; then it sometimes reaches 140 or 150 beats, whilst its character is small, thready, and intermittent."¹

Hemorrhages from the nose, stomach, and bowels occurred. No peculiarity in the respiration was noticed. The symptoms referable to trouble in the organs of digestion were well marked. In regard to the symptom of pain, it is stated that a feeling of soreness extended from the right lumbar region out over the upper front of the abdomen, embracing the lower portion of the chest. Percussion of the region of the liver is not recorded. The urine was not diminished in amount; its specific gravity was 1014; it gave the reaction of bile pigment; the earthy salts were in normal amount on the day of analysis, *i. e.*, the day before retention of urine occurred; the urea was diminished. No crystals of leucine nor of tyrosine were noticed. In regard to the nervous symptoms the period of excitement was not well marked; there was restlessness, but no violence and no convulsions. The stupor lasted with intermissions for an unusually long period. On the 20th, ten days before death, it is recorded that he "lies in a quiet, half-stupid condition day and night." On the 21st he is "roused with difficulty." On the 23d his dejections pass involuntarily, but he "speaks for the first time for three days." On the 25th the stupor was more marked, and he gradually became comatose, and died on the 30th. The anatomical lesions were well marked. The liver was atrophied, and disorganized in its minute structure. The *spleen* was *not enlarged* or congested. There were many *ecchymoses* in the intestines, and extravasations of blood in the lungs, in the mesentery, in the mesocolon, in the vicinity of the pelvis of the right kidney, in the left pectoral muscles, and into the skin of the extremities. Nothing is said in regard to the condition of the brain.

CASE IV.—For the following case, which was published in the *Buffalo Medical Journal* fifteen years ago by Dr. CHAS. A. LEE, I am indebted to Dr. J. F. Miner, of Buffalo.

"Mary B., Irish, æt. 22, servant, generally robust and healthy, entered the hospital of the Sisters of Charity of Buffalo, January 21st, 1853. Has been

¹ Frerichs on Diseases of the Liver. Sydenham Soc. Trans., vol. i. p. 218.

somewhat unwell for several weeks; troubled with nausea and vomiting, and occasionally diarrhoea; seems inclined to coma; but little power over the limbs; skin slightly icterode; temperature natural; face considerably bloated; limbs somewhat œdematous; pulse slow and feeble; tongue furred; disposed to lie on her back. Mustard plaster to epigastrium, and three drops of creasote every hour; half a grain of opium and two grains of blue mass every six hours. January 24th. Pulse 76. . . . Skin yellow, bordering in some places on a dusky brown; . . . inclined to sleep constantly, but says she feels better. January 25. Pulse 68. . . . Countenance sullen; very stupid. No pain. No movement of bowels; increased yellowness of skin." A cathartic was given. "January 26, the stomach rejected most of the medicine; no operation; pulse 88; . . . inclines to coma, but can be roused. No urine secreted; nor has she passed any since her admittance, as far as can be ascertained. Skin deep yellow, or bronze colour, over whole body. Ointment of iodine and mercury to right hypochondriac region, and a stimulating enema. January 27, still comatose; brandy, carb. ammonia, croton oil. January 28, the coma increased; one or two involuntary evacuations; . . . the pulse became feeble and more frequent, and she expired towards morning."

Autopsy ten hours after death.—All the tissues were tinged of a bright yellow hue. Nothing abnormal was noticed in any of the organs except the liver, which was placed in the hands of Prof. JOHN C. DALTON, who has kindly favoured me with the following account of its appearance:—

"Jan. 28, 1853. This liver was reduced to one-half its natural size, and very flabby and loose in consistency. The exterior was in parts pale, but mostly of a dusky hue, considerably darker than the normal colour of the organ. . . . The organ presented the appearances designated by Rokitsansky under the name of 'acute yellow atrophy of the liver.' The cut surface showed a considerable portion in a state of partial hyperæmia, the capillaries in the centre of each acinus being gorged with blood, while the intervening spaces remained of a yellowish colour, giving the marbled appearance to the cut surface known as 'nutmeg liver.' There were also portions in which the whole tissue was so infiltrated with bright-yellow biliary matter, that though the form of the acini was preserved, all the distinction between these component parts was lost; and the hepatic tissue presented the appearance of a congeries of vessels injected with yellow paint. The portions in which this alteration had taken place were mostly globular in shape, and varied from the size of a hazel-nut to that of half an egg. They were considerably more friable than the rest of the hepatic tissue. When situated near the exterior, these portions projected somewhat above the surface of the organ, presenting an appearance very similar to that of a mass of varicose veins, except for the strong yellow colour, which showed distinctly through the peritoneal coat. The bile contained in the gall-bladder was very black and tarry in consistency."

This is a well-marked case of acute atrophy of the liver, lasting about three weeks. The duration of the premonitory symptoms was *probably* about two weeks. The urine was never analyzed, and it is stated that none was secreted. If this latter fact be true, it is the only instance I have found of complete suppression of urine in this disease.

CASE V.—This case is narrated in Prof. AUSTIN FLINT's *Practice of Medicine*:—

"Female, 21; admitted (Bellevue Hospital) Feb. 18, 1865. When admitted she was intensely jaundiced, and so lethargic as not to be able to communicate anything of previous history. With much effort she could be roused sufficiently to reply to some questions, but immediately relapsed into deep somnolency. She resisted attempts to administer remedies. Pulse 65; surface cool; pupils natural; and there was sordes about the teeth. There was considerable tenderness over the liver, and, by percussion, the organ appeared to be diminished in

size. At times she evinced a certain degree of consciousness by calling for food, and facilities for attending to other wants of nature. There were no convulsions. The somnolency eventuated in coma, and death took place, February 25th. On examination after death, the liver was found to be much reduced in volume, more especially in thickness; its weight was one pound and thirteen ounces. It had a mottled appearance, and was quite flaccid. On section it presented a homogeneous, structureless appearance; the colour was deep ochre, and its consistence was almost pulpy. On microscopical examination, the liver-cells had lost their characteristic appearance, and appeared to be mere conglomerations of coarse, brown, granular matter, without nuclei, but with considerable oil. The field also contained free oil-drops and granular matter. The convoluted tubes of the kidneys had lost their epithelium, and were filled with granular matter. . . . No obstruction of the biliary duct. The organs within the chest were healthy. The head was not opened."

The nervous symptoms predominated in this case. Its duration is unknown. We may infer that there was no paralysis of the bladder, nor incontinence of urine.

CASE VI.—"Elizabeth K., aged 17; ill with jaundice six days, and for the first four no very urgent symptoms were present. She then had a fit, became unconscious, and remained so until Dr. WILKS saw her. She was in a state of coma, with stertorous breathing, foam on the lips, teeth clenched, tongue brown, pulse quick, and skin jaundiced—a combination of symptoms suggesting suppression of urine, as well as hepatic disease. On percussion over the liver, only a very narrow region of dulness was discovered, indicative of the great shrinking of the organ. She was a married woman. . . . She had also missed three menstrual periods. In the evening she miscarried, and on the following day she died. The uterus showed that abortion had lately occurred. The liver was very much atrophied, and, when examined by the microscope, not a single healthy or entire cell could be found; nothing being observable but disintegrated hepatic tissue, oil-globules, and the crystalline bodies, such as Frerichs describes under the name of leucine and tyrosine, substances which hitherto have only been made by the chemist by artificial means. The kidney showed the tubules completely filled by disintegrated matters and the same form of crystals. The urine, which had been drawn from the patient during life, presented casts of tubules, and, when evaporated, the substances above mentioned in very large quantities—needle-shaped crystals of tyrosine, and rounded masses of leucine; the latter were mostly found on the film which formed on the surface."—*Lancet*, Dec. 7, 1861.

CASE VII.—"Ellen L., aged 23, admitted under Dr. WILKS' care into Guy's Hospital, on June 29, and died July 7. She had not been married long, and was of dissolute habits. For the first five days, although extremely ill, she was thought to be suffering from simple jaundice. She then, however, was seized with severe vomiting, and fell into a typhoid state; delirium came on, and she died. The post-mortem examination showed ecchymoses on various organs of the body. The liver was shrunken, and lying against the diaphragm; it weighed only one pound and three ounces. Its section showed a peculiar red and yellow mottling, always observed in this disease, and the microscope was unable to detect but very few cells which were not completely broken up."

CASE VIII.—"Eliz. B., aged 30, admitted under Dr. Barlow on July 12, and died July 14. She was a servant, had suffered from jaundice for three or four weeks, and when the severe symptoms appeared she was brought to the hospital. She was then in a dying state, and the nature of the case was evident. The body presented purpuric spots in various parts. The liver was shrunken, so as to weigh only 1 lb. 9 oz.; it showed on the surface, as well as in the interior, a peculiar mixture of red and yellow colours. The tissue was quite disintegrated, so that few entire secreting cells were discoverable. The kidneys were large,

and tubules gorged with dark granular and biliary matter. The urine also contained tubular casts, masses of epithelium, and pigment."

CASE IX.—In the *Medical Times and Gazette* for Nov. 26, 1864, I find that Dr. Robinson showed, at a meeting of the Pathological Society of London, "the liver, spleen, and kidneys of a patient who died jaundiced and in coma. The patient was admitted into hospital for soft chancre, and at the time was jaundiced. He somewhat suddenly became comatose and died." Dr. Harley and Dr. Murchison were appointed to report on the specimen. These gentlemen reported on the 6th of December that the case was one of acute atrophy of the liver: first, because the liver was much below the normal weight, being only $2\frac{1}{2}$ lbs.; secondly, because scarcely any hepatic cells could be found; thirdly, because the tissue of both kidneys contained numerous crystals of tyrosin; and fourthly, because the history of the case and these morbid appearances accord with the view of the case being one of acute yellow atrophy.

CASE X.—In the "Quarterly Report on Midwifery," by ROBERT BARNES, M. D., in the October number of the *British and Foreign Medico-Chirurgical Review*, is an account of a case related by Dr. V. HASELBERG in the *Monatsschrift für Geburtskunde*, May, 1865:—

Patient a female, 39 years old; cook. On June 28, 1864, being five months pregnant, she exhibited slight jaundice, which gradually increased. She, however, continued working till July 2, on which day she vomited blood, and bled from the nose. "Next morning she was found half conscious, undressed, the upper part of her body lying in the bed, the feet on the floor, and on the floor a five months' fœtus with its placenta. In the bed and on the floor was a considerable quantity of blood. She was removed to the hospital, . . . half asleep; roused, she complained of headache. At times she rallied from her torpor; asked how long she had to live. Pulse small, above 120; skin, conjunctiva, and gums intensely yellow. . . . Pressure on the region of the liver causes so much pain that the patient starts out of sleep and cries." Only a very narrow zone of hepatic dulness. Patient died two hours after admission.

Autopsy.—"Icteric tinge over the whole body; lungs and heart sound; spleen large, flabby, strongly congested; in pelvis of both kidneys and in cortical substance small blood extravasations; liver small, weighs scarcely 2 lbs.; it is unusually soft; on its smooth upper surface pale-yellow; the gall-bladder contains only a little yellow mucous gall; sections of the liver show a very uniform pale-yellow colour, with very small and hard to recognize acini. Under the microscope, distinctly defined liver-cells could nowhere be found, but in their places was a copious amount of fine granular fat. Chemical examination revealed abundance of leucine, but no tyrosine."

CASE XI.—The following case is related by Dr. ROBERT BARNES in a lecture published in the *Lancet*, May 20, 1865:—

Mrs. J., mother of several children, aged 35, now (Sept. 15, 1863) about five months pregnant. Has suffered from distressing vomiting during the last month, the matter consisting of blood and mucus. Within a few days of Dr. Barnes' visit (Sept. 15, 1863) jaundice had set in, with great prostration, and continuance of the vomiting. Icteric tinge very marked on the face. Pulse 80. The patient was at this date still intelligent, and answered questions. Stools had been scanty and clayey. "On Sept. 16 there was considerable lethargy, but she put her tongue out slowly when told; has not spoken; pupils dilated, but sensitive to light. The jaundice was more intense on the face and neck; not very marked on hands or legs. Has not vomited much." Labour was induced by rupturing the membranes; the liquor amnii was deeply stained yellow. In

the evening the jaundice had deepened; coma had become more intense; some convulsive twitchings of the arms. Os only slightly dilated. Urine by the catheter normal in amount. On the 17th jaundice deeper, and extended to extremities; coma more profound, with stertor; no uterine action. Death. "The urine was examined by Dr. Letheby; it contained leucine and tyrosine, and bile in large quantity." No autopsy.

CASE XII.—This case is mentioned in the Year-Book of the Sydenham Society for 1860. It is taken from *Schmidt's Jahrbuch.*, vol. 105, p. 185. The case was observed at Coblenz. . . . "The subject was a muscular soldier. There is nothing very particular in the history of the illness. At the autopsy, the brain was found soft and pale; there was an extravasated patch of the size of a groschen" (ten-cent piece) "in the falx, and several small ones beneath the visceral pericardium. Extravasation had also occurred in the folds of the peritoneum."

CASE XIII.—(From the same source.) "The subject was a young female who suffered with some degree of jaundice for *three months* before serious symptoms set in. The cerebral membranes contained much blood; the substance of the brain was swollen, soft, almost fluctuating, full of serum, and moderately injected. The lateral ventricles were filled with pale-red serum, and their lining membrane softened. The muscular fibres of the heart and the tubuli of the kidneys were in an advanced stage of fatty degeneration. The liver was notably shrunken, and in a state of fatty decay, its cells altered and breaking up. The portal blood and the cystic bile contained leucine and tyrosine; in the former there was also an increase of the volatile and fixed acids."

CASE XIV.—(From the same source, 1862.) "Prof. Köhler. Case of acute atrophy of the liver simulating poisoning by phosphorus. An unmarried woman, aged 19, in the third month of pregnancy, died after an illness of forty-eight hours, characterized by rigors, thirst, fever, prostration, and collapse, with hemorrhages from the nose and external organs of generation. A vessel containing phosphorus-paste was found in her possession, which gave rise to the suspicion of poisoning and to a medico-legal inquiry. The post-mortem examination yielded no evidence that phosphorus had been swallowed, but there were yellow atrophy of the liver and fatty degeneration of the heart and both kidneys. In commenting on this case, Prof. Köhler points out the close analogy between acute atrophy of the liver and acute poisoning by phosphorus. The distinction must rest on the local action of the poison, and particularly its tendency to promote ecchymosis and sloughing of the mucous membranes. In cases in which acute atrophy of the liver is accompanied by symptoms resembling those of toxic gastritis, the smell of phosphorus and the detection of the poison by chemical means afford the only indications for diagnosis."

CASE XV.—This is published in the "Reports of the Dublin Pathological Society" in the *Dublin Quarterly Journal* for August, 1867. A young man, æt. 22, who had lived a very hard life up to the moment of his last illness, was admitted into Sir P. Dun's Hospital, under the care of Dr. HENRY KENNEDY, in August, 1865. Pupils dilated; pulse about 66 in the minute. He could not be roused, but could swallow slowly. His body presented a marked, though not a deep shade of jaundice; it was more of a lemon hue. His right arm and legs were jerked at certain intervals, as if by spasm; and this continued to the last. There was no further approach to convulsions, such as Dr. K. had seen in similar cases before. The patient died the fourth day after admission. The entire illness did not last a week. The pulse became rapid on the last day of life, and profuse perspiration occurred. In the report of the post-mortem appearances no mention is made of the condition of the brain, nor of the thoracic viscera, nor of the kidneys, so that these organs may be considered as having probably presented nothing worthy of note. "The stomach and duodenum were found quite healthy, and all the ducts pervious. The gall-bladder was half full of dark-coloured bile. The liver was much reduced in size, and weighed two pounds, all but two ounces"—i. e., thirty ounces. "The upper

surface, and only this portion, was stained of a very dark hue, as if from the exudation of black bile; and the serous covering was somewhat opaque and milky. The left lobe could scarcely be said to exist; it was the merest trace of it which remained, probably not more than one ounce in weight. The under surface of the organ presented a very peculiar appearance. It was very irregular, being made up of a number of prominences, each about the size of a walnut, and projecting more than half an inch from the surface. Whether these were congenital or the result of disease, it would be hard to determine. . . . These lobes were all diseased, and, when cut into, presented a very marked specimen of 'acute yellow softening' of the liver, described by modern writers."

Dr. K. did not consider the view quite correct which connected the disease "acute jaundice," and the condition of the liver known as "acute yellow softening," as cause and effect.

CASE XVI.—(*Ranking's Abstract*, vol. xxix.; *Gaz. Hébd.*, July 6, 1858.) A woman, M. T., æt. 28, had lived in trouble; became jaundiced on October 3. On the 6th liver increased in size; on the 9th, diminished, as shown by palpation and percussion; on the 15th, delirious; and on the 16th, comatose. Occasional convulsions; urine passed involuntarily. On the 18th, icterus more intense; on the 19th, stools involuntary; nearly absolute coma. Hepatic dullness very much diminished. On the 21st, absolute stupor; sanguinolent sputa; death.

Autopsy.—Jaundice of all organs but brain; great number of ecchymoses beneath endocardium of left ventricle; spleen voluminous; liver atrophied, flaccid, and pliable; colour orange-yellow, mixed with red in left lobe. Portal vein empty, hepatic ducts also; urine contained leucine and biliary pigment; no albumen, tyrosine, or glycocholates, nor taurocholates; blood contained leucine; liver contained much leucine, tyrosine, and hypoxanthine.

CASE XVII.—(Same source.) English woman, æt. 21; had suffered much from nursing and grief; conjunctiva became icteric during the last month of pregnancy, and temper very irritable. Was delivered without accident, and did well for three days, but on the fourth was seized with delirium; profound coma; involuntary evacuations; retention of urine. Died on the fifth day after delivery, and probably during the first week of the disease.

Autopsy.—Liver was reduced to nearly two-thirds of its normal volume, and was concealed deep in the hypochondrium; its peritoneal coat wrinkled; its left lobe was merely represented by a small appendix to the right; the organ was flattened and flaccid; its colour was uniform light yellow, except in some points where it was purplish-red; it gave out neither blood nor bile. On microscopic examination the hepatic cells were found to be completely destroyed; a molecular, uniform, yellowish detritus and oil globules were alone visible.

CASE XVIII.—(*Ranking's Abstract*, vol. xxxi.; *Annal. de la Soc. Anat. Path. de Bruxelles*, No. 2, 1859.) A young girl was in May suddenly attacked with rigor and nausea; a bloody stool, intense headache, tympanitic abdomen, and tenderness over the region of the liver. She soon became prostrated and jaundiced, and died four days after the appearance of the first symptom. On post-mortem examination the liver was found to be alone seriously affected. Its surface was adherent to the diaphragm, and covered with patches, the results of inflammation, which extended into the substance of the organ. The organ was intensely yellow, softened, and diffuent under pressure. Microscopic examination agrees with those previously reported. Nearly a quart of black grumous blood was found in the stomach and intestines. It is stated that no atrophy of the liver occurred, but as neither the weight of the body nor that of the liver is given, and as the organ was stated to be in a complete state of fatty degeneration, and softened and diffuent, this statement must be regarded as doubtful.

CASE XIX.—(*Edinb. Med. Journal*, vol. xi., 1865.) Mrs. H., æt. 35, admitted to hospital February 11, 1865, nearly moribund. She was in the sixth

month of pregnancy, and leading an unhappy life on account of domestic quarrels. About the last of March began to feel ill and to vomit, and was jaundiced. On the morning of February 11 became very stupid, and vomited a large quantity of blood; after this she vomited blood almost incessantly; fecal evacuations involuntary, dark-coloured, and fluid; became delirious; labour came on, and on the morning of the 12th she was delivered of twins, and died.

Autopsy.—Skin yellow, blood dark and fluid. Patches of extravasation under visceral layer of pericardium. Liver atrophied to one-half its natural size and flattened; weight $23\frac{1}{2}$ ounces. Beneath capsule and throughout substance were numerous ecchymoses, and small patches of an ochre-yellow colour. Microscopically the organ was in the usual state of degeneration in this disease. *Kidneys* in a state of fatty degeneration. In the urine crystals of leucine and tyrosine were found, and a little albumen; no biliary acids; considerable biliary colouring matter.

CASE XX.—(*Edinburgh Medical Journal*, February, 1868, reported by A. C. WILSON, M. B., &c.) Elizabeth R., æt. 25, single, intemperate, admitted to infirmary December 6th. Disease beginning with nausea and vomiting, lasted about fourteen weeks; jaundice during last three weeks of life. On December 7th, drowsy; December 8, vomiting and vaginal hemorrhage; December 9th, involuntary light-coloured stools; muscular rigidity, and slight opisthotonos; free hemorrhage from vagina and rectum; death on December 10th. Urine drawn before death contained leucine, tyrosine, creatinine, and fatty casts.

Post-mortem appearances.—Skin yellow, extravasations of blood beneath skin, and beneath pericardium; liver weighed less than two pounds, much of it was of a bright ochre-yellow colour; there were numerous extravasations of blood in its substance; cells of kidneys and liver degenerated; uterus unimpregnated.

I have given, at the risk of being tedious, a sufficient number of cases by way of illustration, to show the marked characteristics of this disease, one of the most striking and most regular of the fatal affections. These cases prove that it is not by any means exclusively a disease of pregnancy, nor confined to either sex, and also that its occurrence before the age of puberty is very rare. As the first few cases are given in detail, commented on and analyzed at length in the text, I will merely add a few generalizations, and then speak of the disease, we have been considering, and the effects of poisoning by phosphorus, a subject which has attracted the attention of pathologists within the last six or seven years. The disease does not seem to be more common at one season of the year than at another; thus, out of twenty-one cases there occurred

In January	2	In August	1
" February	2	" September	3
" April	1	" October	2
" May	1	" November	2
" June	2	" December	3
" July	2		

Adding these twenty cases to the thirty-one recorded by Prof. Frerichs, we find that of the 51 cases, 13 were men and 38 females, so that the number of the latter is nearly three times as great as that of the former. Of the 38 females, 17 (or less than half) were attacked during pregnancy, and 21 were not pregnant; so that 17 cases out of 51, or one-third,

occurred in pregnant females. "A circumstance which points to both of these conditions (sex and pregnancy) as predisposing causes. Nevertheless, acute atrophy of the liver is a rare affection, even in pregnant females; out of 33,000 cases, Spæth found this complication present in only two instances."¹ In regard to age, Frerichs is of opinion that the period of life between 20 and 30 seems most predisposed to the disease. Of the 51 cases, the age is not given in 3 cases, namely, one "a young female," one "a muscular soldier," and one "in hospital for soft chancre;" of the remaining 48 cases, there were:—

9	between	10	and	20	years of age,
28	"	20	"	30	" "
9	"	30	"	40	" "
2	"	40	"	60	" "

Severe mental emotions undoubtedly precede the attack in many instances; excesses, drunkenness, and dissoluteness of life have occasionally preceded the disease; typhoid fever also sometimes is accompanied or followed by acute atrophy of the liver; yet it is not possible, as Frerichs observes, to prove the influence of these conditions as causes of the disease. He thinks, however, that the influence of mental emotions can scarcely be doubted, and has seen one case of acute atrophy of the liver proceeding from typhoid fever.

Anatomical Lesions.—In 49 cases the liver was much diminished in size. In Case I. the weight of the liver was one pound six and a half ounces, and the relative weight to that of the entire body as 1 to 117.30, indicating a reduction of more than two-thirds below the normal weight of this organ in a person weighing 165 pounds. The liver is flattened, and its cut surface often presents an ochre-yellow or rhubarb colour, generally in circumscribed spaces, but sometimes the whole organ is uniformly coloured yellow. The bloodvessels of the liver are often nearly empty. The cells of the liver are more or less generally destroyed, and in their places are found the results of fatty degeneration and the coloured masses and granules described in Case I. The bile-ducts have always been found pervious, and the gall-bladder is sometimes empty and sometimes contains considerable bile. Frerichs states that the spleen is, generally, considerably enlarged and congested, but I do not find that this change has been generally noticed in the twenty cases here reported, though in one there was no autopsy. The stomach and intestinal canal are generally unaltered, sometimes the mucous membrane is ecchymosed. The contents of the intestines are either dry clay-coloured feces, or tarry-looking matter consisting of altered blood. The blood is variable in character, sometimes coagulable and sometimes not, but generally dark. Extravasations of blood in various parts of the body occurred in seven of the nineteen cases here recorded. Such

¹ Op. cit., p. 233.

extravasations are reported as having been observed in the skin, or beneath the pleura, or in the lungs, or in the pericardium, or beneath the endocardium, or in the mesentery and mesocolon, or beneath the peritoneum, or in the neighbourhood of the kidney, or in the brain, or in the muscles. The kidneys are often in a state of granular or fatty degeneration. The brain is occasionally softened, and the heart has been found in a state of fatty degeneration. Of these fifty-one cases, in six the date of the beginning of the disease was unknown; in the remaining forty-five the fatal termination occurred—

During first week . .	20 times.	During fifth week . . .	2 times.
“ second week . .	8 “	“ seventh week . .	1 time.
“ third week . .	6 “	“ fourteenth week .	2 times.
“ fourth week . .	6 “		

“The termination has almost invariably been fatal; this result has been so constant, that the few observations which have been recorded of a cure having taken place must be regarded as of a very doubtful character.”¹

The *prognosis* of this disease is always unfavourable, and no satisfactory results can be hoped for from treatment. The nature of the disease is very obscure. It is obvious that death is caused by what we call “a poisoning of the blood;” and this much we know definitely, namely, that urea disappears from the urine, and abnormal substances make their appearance in that fluid, and that urea is found in the blood. We know well the symptoms of the disease and its pathological lesions, but any theory in regard to the primary cause is purely hypothetical. For the various hypotheses in explanation of the morbid processes that take place in the liver, blood, kidneys, &c., the reader is referred to the work so frequently quoted here, to Rokitsky's account of the disease, and to the various foreign journals, especially the German, which have been published during the last ten years.

Similarity between Poisoning by Phosphorus and Acute Atrophy of the Liver.—Much has been written on the physiological action of phosphorus during the last six or seven years. All writers, so far as I have examined their statements, agree that phosphorus, taken internally, produces a fatty degeneration of the secreting portions of the kidney and liver; in many instances the heart and lungs were in a state of fatty degeneration, and even the brain also. Lewin² made experiments on rabbits and frogs, and found fatty liver in six out of eight rabbits which had lived eight days after the administration of phosphorus.

“Numerous papers on poisoning by phosphorus are to be found in the foreign, and especially in the German, journals for the past year, which fully confirm the modern views of the similarity of the symptoms with those of acute atrophy of the liver, and of the rapidity with which fatty degeneration of almost all parts of the body occurs in these cases.”³

This subject is considered and accounts of cases may be found in the

¹ Op. cit., p. 223.

² Sydenham Soc. Year-Book, 1863.

³ Ibid.

Union Médicale, in the *Archives Générales*, in *Virchow's Archives*, in *Canstatt*, in *Schmidt's Jahrbuch*, in *Wagner's Archives*, in the *Medico-Chirurgical Transactions* for 1867, in the Vienna medical journals, and in other periodicals. From what I can learn, it seems to me that the action of phosphorus on the liver is secondary to a change in the constitution of the blood, and that fatty degeneration of the liver is not necessarily the cause of death, because sometimes a fatal result follows poisoning by phosphorus, and the liver is found to be neither atrophied nor fatty.

EXPER. I.—To a large healthy dog a grain of phosphorus was given three times a day, beginning on the 10th of February, 1868. On the evening of the 11th he had taken in all six grains, and seemed unaffected. On the morning of the 12th he took his breakfast, with a grain of phosphorus, but soon vomited; during the day he was quite sluggish, and refused food; the vomiting continued at intervals. On the 13th he passed no water, and became more and more stupid. On the 14th he became more and more somnolent, and died in the afternoon, after having had some convulsive twitchings. He lived four days and a half after the administration of the first grain of phosphorus. Hemorrhage of black blood occurred about the time of death, from the nose and anus.

Autopsy eighteen hours after death.—Rigor mortis very marked. Weight of body 87 lbs. *Brain* very soft. Ecchymoses of various sizes in the fatty and cellular tissue over the five lower ribs anteriorly, also beneath the costal pleura, beneath the pleura of the lungs, in both mediastina (marked extravasations), in the fatty and cellular tissue around the pericardium, beneath the pericardium, epicardium, and endocardium, and into the substance of the heart. Bloody serum in pericardium. Blood in heart and elsewhere dark-coloured and fluid; it does not coagulate when exposed to the air. Stomach contains about 6 oz. of dark, tarry-looking liquid, which the microscope shows to be blood. Although this fluid was quite glutinous, and adherent to the lining membrane of the stomach, yet that lining appeared healthy when this fluid was removed. A small amount of bloody serum in the peritoneal cavity; extravasations of blood beneath the peritoneum in various places, into the pancreas, and into the cellular tissue of both spermatic cords. The bladder contained about 30 oz. of rather dark-coloured, opaque urine. Microscopically, the urine contained many epithelial cells stained yellow or brown, a few waxy casts, and many needle-shaped crystals of a purple or golden-brown colour, aggregated in bundles or in arborescent groups (tyrosine?). Urine albuminous; gave a faint reaction of colour with nitric acid; contained no biliary salts. *Liver* was sufficiently firm, and presented no remarkable appearances to the naked eye. Weight, 1 lb. Examined microscopically, the liver was found to be quite fatty, the cells crowded with oil-globules, with no distinguishable nuclei; the field seemed to contain nothing but oil-globules, and liver-cells filled with oil. The kidneys were healthy-looking to the naked eye, but, examined microscopically, the tubules seemed to have lost their epithelial lining. The liver did not resemble the liver of a case of acute atrophy, except in being fatty.

EXPER. II.—A cat took about two grains of phosphorus in forty-eight hours, beginning Feb. 16, 1868. Died at noon on the 18th.

Autopsy twenty-four hours after death.—Marked cadaveric rigidity.

Weight, $6\frac{1}{2}$ lbs. Brain normal. *No extravasations of blood anywhere.* Blood in heart for the most part fluid, and of a dark colour. Bladder firmly contracted, empty. All the organs healthy, except the liver, which was fawn-coloured, and looked exactly, except in shape, like the liver of a codfish. Kidneys perhaps rather coarse-looking. Microscopically, the liver was found to be extremely fatty, the cells gorged with oil-globules; no coloured granules or masses were seen. Kidneys, microscopically the tubules of the cortical substance were crowded with fat-globules, which had taken the place of the epithelial lining.

In the first experiment there was retention of urine; in the second, suppression. In the first, extravasations of blood formed the most marked post-mortem appearances; in the second there were none. In both, the livers were fatty, but the cat's much the more so. The cat's kidneys were more diseased than the dog's, apparently.

In eight cases of poisoning by phosphorus in the *human* subject, the symptoms were as follows :—

Breath light and phosphorescent		in 1 case.
“ smelling of phosphorus .		“ 4 “
Vomiting		“ 5 “
“ of blood		“ 1 “
“ and purging, violent .		“ 2 “
Vomited matters phosphorescent		“ 2 “
Epigastric pain		“ 2 “
“ “ on pressure		“ 3 “
No pain		“ 1 “
Restlessness and irritability		“ 3 “
Lumbar pain		“ 1 “
Thirst		“ 3 “
Dyspnoea		“ 1 “
Rigors		“ 2 “
Jaundice		“ 3 “
Tympanitis		“ 2 “
Suppression of urine		“ 2 “
Convulsions		“ 1 “
Delirium		“ 1 “
Somnolence		“ 2 “
Recovery		“ 2 “
		{ 9 hours “ 1 “
		{ 2 days “ 1 “
Duration in fatal cases		{ 3 “ “ 1 “
		{ 4 “ “ 1 “
		{ 5 “ “ 2 “

Post-mortem appearances in six fatal cases :—

Jaundice		in 3 cases.
Echymoses in many tissues and organs .		“ 2 “
“ “ lungs only		“ 1 “
Blood in a liquid state		“ 6 “
Bloody serum in pericardium		“ 1 “
“ “ “ pleural cavity		“ 2 “

Ascites	in 1 case.
Bloody fluid in alimentary canal	" 2 "
Alimentary canal generally healthy	" 6 "
Liver and kidneys healthy	" 1 "
" enlarged and buff-coloured	" 3 "
" cells very fatty	" 3 "
" firm	" 1 "
Spleen enlarged	" 1 "
Tubuli of kidney very fatty	" 3 "
Fatty infiltration of every tissue examined	" 1 "

The similarity in the symptoms of the two affections is, I should judge, rather more marked than in the post-mortem appearances. In both there may be vomiting, either of an hemorrhagic character or not; there may be pain at the epigastrium, restlessness and irritability, rigors, jaundice, tympanitis, retention of urine, delirium, somnolence, convulsions, and coma. After death there may be found, in both, extravasations of blood in various tissues and organs, blood liquid and dark-coloured, bloody fluid in alimentary canal, fatty degeneration of the liver and kidneys, and ascites (generally slight). But, so far as my observations or reading of descriptions have extended, the gross appearances of the liver are very unlike. It is not so limp and shrunken and atrophied, nor has it the peculiar rhubarb-like colour (in many parts), in cases of poisoning by phosphorus, that it has in acute atrophy.

ART. V.—*Delusion Considered as a Test of Insanity.* By I. RAY, M. D.

ON the trial of Hadfield, eight and sixty years ago, for shooting at the king, his counsel, Mr. Erskine, laid down the doctrine that delusion is that quality of insanity which renders a person irresponsible for his acts. Though never established by any judicial decision, yet announced as it was by the acknowledged leader of the English bar, in a case that appeared, by universal consent, to justify its correctness, it has, undoubtedly, exerted an influence on judicial opinions, and may be considered as the first considerable innovation upon the rules of the common law respecting insanity in connection with crime. For nearly half a century, its correctness as a rule of law went unchallenged in any British or American court of justice; but correct as it seemed, abstractly considered, it frequently proved unsuitable for practical application, owing to some uncertainty as to the true meaning of the trait in question. Many attempts have been made to remedy the deficiency, but being suggested rather by metaphysical speculation than the results of actual experience, they invariably failed to meet the requirements of the particular case in hand.

One writer defines delusion to be "the belief of facts which no sane man would believe." Another defines it to be "a belief in something extravagant, having no existence whatever, and out of which the person cannot be reasoned by any conceivable degree of evidence." Another says, "delusion is a belief of facts which no rational reason would have believed." According to these definitions, Columbus must have been labouring under a delusion in thinking he should discover a new world, for such a belief was certainly extravagant—one which the rational men of his day rejected, but which he could not be reasoned out of. Many a worthy man entertains political or religious opinions which, to some of his neighbours, seem to be the height of folly; and holds them too with a strength of conviction that no evidence can impair. In these definitions, it will be observed, the very point to be proved is assumed. To say that a certain belief is a delusion because no sane man would entertain it is just a begging of the question. Another says a delusion is a belief in something impossible. But who is to decide what is impossible? who can decide it? What is impossible to one man is possible to another. Belief in something which is impossible in the nature of things is, unquestionably, a delusion, but every delusion is not a belief in something clearly impossible. Many a delusion consists in believing, not something impossible, but something without any objective foundation. A man believes that he has fifty thousand dollars on deposit in a certain bank; but although a bank deposit is not an impossible thing, yet, as this person never had a deposit in any bank, having always been little better than a pauper, such a notion, is nevertheless, a delusion. So, although a delusion may be defined very justly to be a belief in something impossible, it must be understood that the impossibility may be, not in the nature of things, but in the circumstances of the case. With this qualification the definition may be found applicable in practice, with fewer exceptions than any other. Of course, instances will occasionally occur, where it is questionable whether the circumstances are such as to render the thing believed in impossible, which only shows that psychological definitions are not quite so clear and precise as those of geometry and algebra.

The current philosophy respecting the nature of belief has not led to very clear conceptions on this subject. The tendency is to depreciate every other element of belief as compared with that of the evidence of the senses. To a great extent human belief must rest on that foundation, but much of the belief which determines the opinions and conduct of men springs from the prevalent philosophy, from tradition, from the force of imitation, from superstition, fancy or fashion, from a nervous temperament, and mental eccentricities. Daily experience shows that under the influence of such causes, no belief is too absurd and groundless, even for cultivated minds. The history of human progress in its various phases shows that the accredited belief of one age becomes an indication of

insanity in the next, and the psychological student who extends his observations beyond himself into the highways and byeways of society—into the purlieus of vice and the wards of the insane hospital—wherever the normal activities of the mind have been disturbed by the deteriorating influence of an unhealthy hygiene, of bad blood, of education in vice, of indulgence in drink, continued through several generations, will find at every turn how closely the domains of sanity and insanity lie to each other.

In order to determine whether a certain belief is a veritable delusion, or only the mistake of a sane mind, it may be necessary to scrutinize the psychological character and experience of the individual who entertains it. Such a scrutiny may show that what seemed to be the offspring of disease—what would have been unequivocal delusion, under different circumstances—was only a mistake of ignorance, a sottish superstition, a freak of eccentricity, or the suggestion of a peculiar temperament. A single instance will sufficiently illustrate the significance of these remarks.

In litigated cases of insanity where delusion is alleged, the medical witness seldom escapes being asked if he thinks Martin Luther was insane for having believed that he was sometimes visited by the devil in person, and that on one occasion he hurled his ink-horn at him and drove him out of the room. This the lawyers regard as an admirable dilemma, on either horn of which the expert will find an uncomfortable seat. If he says no, the answer conflicts with some definition of delusion which he has already given, and if he says yes, it is equivalent to stultifying himself. Thus the counsel achieves an easy victory over the expert, who, while perfectly aware of his awkward predicament, is sorely puzzled how to account for it, for his opponent's facts are all correct and his conclusions logically drawn.

Of course, the scenes related by Luther were all a figment of the brain, but, at the worst, it was only a hallucination, not a delusion. They differ from each other in this respect, that the false belief implied in the former is connected with impressions made on one or more of the senses, and does not necessarily prove, as the latter does, any derangement of the understanding. When a man declares that he hears a voice speaking to him from the ceiling of his room, and persists in the belief, he is certainly insane; but if he recognizes and admits his mistake, it is only a casual and temporary derangement of the senses, which cannot, in any proper use of language, be called insanity. Now admitting that Luther persisted to the last in believing that there was no optical deception in the case, and that the devil, hoof, horns, and all, actually entered the room where he was writing, the proof is not complete that this belief was equivalent to a delusion. A close inspection of it shows that it was only a mistake arising from certain peculiarities of opinion, temperament, and cerebral activity, and wanting the indispensable element of morbid action. It was, certainly, no delusion to believe in the personality of the devil. It has been the doctrine of the church in all ages, and men have been fond of representing

him as going about like a roaring lion seeking whom he may devour. Stories of his bodily appearance among men have always been current, and credited by the ignorant and vulgar, if not the cultivated and refined. His visits have not been confined to members of this or that church, nor has his reception differed with their modes of faith. While the reformer salutes him with his familiar weapon—that weapon by which he spreads consternation among his foes—St. Dunstan tweaks his nose with a pair of red-hot tongs. Indeed, in the middle ages, the devil's doings on earth was a favourite theme of the clergy, whereby they hoped to terrify the sinner and strengthen his sense of dependence on them. Legends of his pranks were rehearsed at every fireside and social gathering, and no philosophic doubts arose to weaken the intensity of this belief. Then as now he was regarded as at the bottom of all the mischief in the world, the only difference being that while it is with us, generally, a merely speculative belief, like that of an old superstition which reason discards but which maintains its hold on the mind by the force of early impressions, it was with the people of those times a real, active, earnest belief verified by many a man's personal experience. From a belief in his personal existence and his license to do mischief, to that of his personal bodily presence among men, was but a step. Considering the power with which he was endowed and the great purposes that might be fulfilled by an actual visitation, its possibility could hardly be questioned. That Luther should have so believed, there were peculiar reasons over and above those of a general nature. Though an energetic reformer, he was no philosopher like Erasmus, and therefore was quite satisfied with the popular belief of his day. He never doubted that in the great contest on which he had entered, the powers both of earth and hell were arrayed against him, and the pope and his priests were not more clearly discerned in the opposing ranks than the devil and his angels. Thus far, certainly, there was no delusion. He believed no more than everybody else believed. If there was any delusion at all in the case, it consisted in going one step farther—in realizing his theoretical belief. He thought he saw the devil with his bodily eye, and felt his hot breath upon his cheeks. But this was not necessarily a delusion. It might have been merely a strong impression received in a moment of cerebral excitement when the nervous susceptibility was sharpened by earnest meditation, by a glow of enthusiasm not many steps removed from the grossest fanaticism, and by a well-grounded assurance that his foes would leave no stone unturned to effect his ruin. Under such circumstances, the inward readily becomes the outward; the intense conception takes on a bodily form; in one word, to use a metaphysical phrase, the subjective becomes the objective. That such was actually the fact in Luther's case is rendered still more probable by other incidents in his psychological experience. He complained that the devil lay by his side when in bed at night, and caused him more annoyance than his beloved Catharine caused him

joy. Not only that, but the devil would keep him awake disputing on religious subjects, and these disputes he reported in full. This phenomenon is admirably illustrated by Shakspeare, in the case of Macbeth, who saw a dagger in the air with its handle turned towards him. Indeed, most persons, I apprehend, can call to mind something of a similar kind in their own experience, and many remarkable stories may be found in the books. Nobody ever regarded Macbeth as insane, and yet, psychologically considered, Luther's case was precisely similar.

It may be objected that as Luther never recognized the true nature of the apparition, and fully admitted that he was deceived, therefore, according to present definitions, he must be regarded as insane. The objection is well taken, but a careful examination of it will enable us, I doubt not, to remove the difficulties which it implies. It has been just explained how the deception arose, that is, in consequence of a conjunction of circumstances not incompatible with entire soundness of mind. That Luther did not so understand the matter only shows that he was no philosopher, as I have already remarked, and that to his apprehension, the incidents in question were within the line of natural occurrences. To believe in the reality of a hallucination necessarily implies delusion and insanity only when it refers to something impossible either in the nature of things or the circumstances of the case. One who believes his legs are made of glass or that his head has got turned round, is insane and nothing less. He does not even pretend to give a reason for his belief. It is so, and he *knows* it is so. On the other hand, if the thing believed is not thus impossible, it may indicate only an error of opinion which the person shares in common with others of undoubted sanity. Thus the two elements of Luther's belief are easily accounted for without resorting to the theory of insanity. The apparition itself was the result of certain cerebral conditions of a casual, transient nature; and, secondly, the persistent conviction of its reality was consistent with the common belief.

The world has always been willing to admit that supernatural occurrences are within the limits of possibility, and that they have actually taken place. How they are to be distinguished from those which, while they appear to be such, at first sight, are, in fact, the offspring of cerebral disturbance, is a question not easily answered. As yet there is scarcely the beginning of an approach to unanimity of opinion respecting it. In practice, it has been generally decided rather by favourite habits of thinking than by any fixed rules of philosophizing. The celebrated vision of Colonel Gardiner, in which he saw the Lord Jesus Christ on a cross, and heard him reproach him for his crimes, is described by his pious biographer, Dr. Doddridge, as sent by God. Few, I imagine, would attribute to such an origin the vision of Lord Herbert, who, while hesitating to publish a book he had just completed against the Christian religion, made a formal appeal to the Deity, praying that he might be directed by some celestial sign, whether he should

or should not print it, and received a favourable response in an audible voice from the heavens.

We know very well that hallucinations have been exhibited by men of great mental endowments and activity, as an insulated fact having little or no connection with the ordinary mental movements. Dr. Johnson, while walking in the street, thought he heard the voice of his mother, then many miles away, calling to him, "Sam, Sam." Cromwell was fond of relating, in the days of his power, that, while a lad at school, a female of gigantic height entered his room and announced to him his future greatness. Lord Castlereagh, while visiting a friend, in early life, saw at night, before going to sleep, the vision of a radiant child with a glory encircling his head. Again, he saw it many years afterwards in the House of Commons. Bernadotte, the King of Sweden, while riding in the country, was met by a dishevelled, witch-like old woman, who warned him not to engage in an enterprise he was meditating. Napoleon was once found by one of his generals, in his cabinet, so abstracted and self-absorbed, that the latter thought he must be ill. The Emperor seeing him, at last, told him to look up. "Do you not see her?" said he; "she is before you, bright and brilliant. She has never abandoned me. I have seen her on every great occasion. She tells me to go on, and she is always the sign of good fortune." Sir Joshua Reynolds, after being engaged many hours in painting, and then walking in the streets, said that the lamp-posts seemed to him to be trees and the men and women moving shrubs. Silvio Pellico had hallucinations in prison. He heard groans and stifled laughs. It seemed to him that while sitting at the table some one plucked him by his coat, and attempted to blow out his light. While young, when in a room alone at night, without any light, he saw phantoms all around him, and even after the lights came, he would see them in the dark corners.

In most, if not all of these cases, there was, undoubtedly, some cerebral defect, but, although hallucinations may indicate that the highest quality and condition of the brain are not present, yet they do not imply unsoundness—insanity. In fact Moreau de Tours considers them a proof in favour of his theory, that insanity and genius spring from cerebral conditions essentially alike. In some of the cases just mentioned, the defect was an insane temperament—that constitution of mind in which there is an hereditary tendency to insanity indicated by singularities of conduct, opinion, manner; in some, it was a high degree of nervous susceptibility readily inducing cerebral movements of an extraordinary character; in some, it was a casual determination of blood to the brain; and in some it was manifested by epilepsy or other nervous disorder. Luther's case furnishes no exception to the general rule, for though technically sound, it can hardly be doubted that the genius of the great reformer was of that kind which is nearly allied to insanity. The fact need not be regarded as derogating from his mental ability, for it may have fitted him all the better

for the part he was called to perform. A man of cooler passions and less intense conceptions might have written books less offensive to a refined taste, and avoided some injudicious courses, but proved unequal to the internecine war which any determined attempt at reformation was sure to provoke. In such conflicts it is not always the well-balanced minds that achieve the noblest victories. Then, it would seem as if the individual must be moved by the quicker and stronger impulses that proceed, if not from disease, yet from some abnormal condition very like it.

I have dwelt on the case of Luther, not so much because it represents a considerable class as because it indicates the line of inquiry on which all of a doubtful origin should be examined. It gives us a clew to the follies of witchcraft and to those popular delusions which prevailed epidemically in the fifteenth, sixteenth, and seventeenth centuries. Witchcraft, for instance, was a matter of popular belief. The clergy preached it, the courts punished it, and the Bible was supposed to teach it. Few doubted it, and fewer still ventured even to whisper their doubts. The first step thus accomplished, the next was not difficult. The arts of the devil and the malicious acts of his deluded followers, the compact written in blood and the hellish orgies of the witch-sabbath, the riding through the air on broomsticks, the witch marks found on the person, the potent efficacy of prayer and of the utterance of sacred names—all these were topics of conversation in the family circle and in social gatherings, exciting wonder and awe, and leaving impressions never to be effaced. With few books and no newspapers, with scarcely any interchange of ideas beyond a very limited circle, with the hardships incident to a new settlement, the habitual dread of hostile neighbours, and the gloom of the surrounding forest, all combining to exclude the joyous and hopeful aspects of life, it is just what might have been expected, that being thus early and constantly familiarized with the wondrous scenes of witchcraft, they should have become, at last, so vivid to the minds of our New England forefathers, as to assume, occasionally, the appearance of an objective reality. For this there was only needed, singly or collectively, a constitutional tendency to hysteria or insanity, an ardent imagination kindled solely by such material as witchcraft lore could furnish, and that propensity to imitation and thirst for notoriety which act so large a part in producing eccentric mental movements, especially in the female sex. Thus was the second step accomplished, and all without the occurrence of proper insanity.

Many false beliefs springing from a coarse superstition can be distinguished from genuine delusions only by a careful investigation of the individual's mental habits and associations. The difficulty of making this distinction is sometimes increased by the fact that such beliefs may have been modified and made the ground of criminal conduct by the presence of actual disease. A coloured man who once came under my charge had killed his mother in a paroxysm of insanity. When asked, after recovery,

what prompted him to commit such a horrid deed, he replied that he thought she was working some fatal spell of witchcraft upon him, and therefore he acted in self-defence. On further inquiry, however, it appeared that, following the traditions of his race, he had always believed in witchcraft, and had always suspected, if not believed, that his mother practised it. So that the belief which led him to kill his mother was not a delusion; and yet it was none the less a valid excuse for the crime, for the reason that while the belief was, ordinarily, passive and harmless, it became under the excitement of a maniacal paroxysm, an incentive to a most revolting murder.

For the most part, the true character of a false belief may be inferred from the accompanying traits and incidents. A single, independent, solitary delusion accompanied with no other deviation from the normal condition, is a rare occurrence. It is usually associated with other delusions or singularities of thought, with peculiar ways and manners, with strange and irrelevant conduct. When any of these traits are present, there needs no refinement of definition to convince us that we have to deal with a genuine delusion. And yet we are hardly ready to accept the proposition of Dr. Forbes Winslow, "that no notion of the mind, however ridiculous, fallacious, and absurd, should be admitted to be a delusion or evidence of unsound mind, unless it be obviously and unmistakably the product of a diseased intellect." No one knows better than Dr. Winslow how difficult it is frequently to show that an unquestionable delusion is the product of disease. The delusion is sometimes the sole, solitary indication of disease; and even when accompanied by other minor disturbances, it is not a very philosophical proceeding to make them the proof of the principal and prominent one. If he means to derive the evidence of disease from the quality of the act which springs from the delusion, as he may very justly, we can only say that such an inference would receive little countenance from the courts.

There is another phase of belief of great medico-legal importance, which often proves no less embarrassing than delusions. I refer to such notions as are characterized less by false belief than by singularity and extravagance to a degree that may seem incompatible with soundness of mind. No rule nor definition will enable us to distinguish such as spring from insanity, and such as are only the freaks of what is called eccentricity. The reason is, that there is really no dividing line between these two mental conditions. The latter may exist from childhood and continue for life, but we know that it is often the precursor of insanity, and no amount of skill or sagacity can determine the limits of the transition period. To avoid mistake as far as possible, we must be guided by the antecedents of the person, by an enlarged knowledge of mental disease, and especially of diversities of character, always bearing in mind what our experience of men teaches, that very strange opinions have been entertained by persons of unquestionable sanity. We are not too readily to pronounce a man in-

sane because he professes views that may be at variance with our notions of moral propriety. This mistake has been made, I think, by an eminent American jurist, Judge Redfield (On the Law of Wills, 83), in commenting on an English case (*Morgan v. Boys*). A will was contested on the ground of insanity, the proof of which was to be found in one of its dispositions, that his executors should "cause some parts of his bowels to be converted into fiddle-strings, that others should be sublimed into smelling salts, and that the remainder of his body should be vitrified into lenses for optical purposes." In a letter attached to the will, the testator said, "The world may think this to be done in a spirit of singularity or whim, but I have a mortal aversion to funeral pomp, and I wish my body to be converted into purposes useful to mankind." The Judge does not insist "that the mere absurdity and irreverence of the mode of bestowing his own body as a sacrifice to the interests of science and art, in so bold and awful a mode, was to be regarded as plenary evidence of mental aberration," but he thinks that a jury would be very likely to regard it in this light—and not unjustly—in case of an unnatural or unofficious testament. "The man who has no more respect for himself or for Christian burial, than this will indicates, has no just claim to the regard or respect of others." A broader view of the subject may lead to a different conclusion. The present mode of disposing of the body is not so strongly fixed in the instincts or custom of mankind as to prevent an occasional deviation, under the influence of some potent motive, like a devotion to science, a contempt of vulgar prejudices, a foolish but not diseased love of notoriety. Jeremy Bentham directed his body to be dissected, and accordingly it made its appearance on the table of one of the anatomical theatres of London. A distinguished surgeon of Massachusetts ordered that his skeleton should be prepared in the usual way, and placed in the museum of an institution of which he was President. A few years since an Englishman, who had lived much in the East and professed his belief in the Mahometan religion, left a will, bequeathing his property, with the exception of various legacies, to the poor of Constantinople, and also towards erecting a cenotaph in that city, inscribed with his name, and bearing a light continually burning therein. A thorough review of the habits and opinions of the testator showed that there was nothing strange or absurd in this bequest, and it was finally admitted to probate. (*Austen v. Graham*, 29 Eng. L. & Eq. 38.)

A remarkable case was recently published in the *Annales Medico-Psychologiques* for July, 1866, under the title "PARTNERSHIP WITH GOD," that is worthy of an extended notice in a paper like this, because it illustrates very strikingly the principles that should govern our judgment in this class of cases. In 1861 there died at Neufchâtel a notary, Isaac Vaugneux, 82 years old, married, but childless. He devised his property to his wife, who died four years after, and she devised it to her niece, who, when quite young, had been adopted by them. Among her uncle's papers

this niece found one sealed up, bearing this inscription, *Contrat de Société*. On examination it proved to be articles of partnership drawn up some years before his death, when about to leave his legal employments and engage in the wine and liquor trade. Nothing less than a literal copy of this document can give an adequate idea of its character.

“ARTICLES OF PARTNERSHIP between the great Sovereign God, the all-powerful and all-wise Eternal on the one part, and me, the undersigned, Isaac Vaugneux, his very vile, very miserable, and very humble servant and zealous adorer on the other, have been drawn up as follows:—

Article 1. This connection has for its object the trade in liquors.

Art. 2. My very respectable and very magnanimous associate will deign to bestow, as his share in the capital, his blessing on our enterprise, in the manner he shall judge most agreeable to his paternal views and the accomplishment of the immutable secrets of his eternal wisdom.

Art. 3. I, the undersigned, Isaac Vaugneux, engage, on my part, to turn into the above-named partnership all the capital that may be necessary; to do all the business required in the hiring of cellars; in the purchases and sales; in keeping the accounts; and, in one word, to devote my time, my labour, and my moral and physical powers, to the best good of the concern, conscientiously and in good faith.

Art. 4. The books, kept by single entry, shall exhibit every transaction; and the several balances, carried to the debit and credit side, shall be increased by interest calculated *pro rata*, up to the 31st of December of each year, when a settlement of the account shall be made.

Art. 5. The net profits shall be equally divided between my high and mighty Associate and myself.

Art. 6. A special account shall be opened with him, in which shall be passed to his credit his share of the profits, and to his debit the several sums which shall have been delivered by me, the undersigned, either to pious corporations, to the poor individually and collectively, or finally to any other pious work which the Spirit of my God shall inspire me to do.

Art. 7. When my God shall deem it good to take me from this world, the settlement of the affairs of the partnership shall be immediately intrusted to my nephew, M. Frederic Preud'homme Favarger, who is hereby requested by me to undertake this charge, after which the share of the profits coming to my great and well-beloved associate, is to be immediately delivered to the direction of the praise-worthy chamber of charity of Neuchâtel, to which I now bequeath it.

With the liveliest satisfaction in having associated my God in my labours, I commit myself for success to the wise dispensations of Providence.

Thus done, covenanted, and settled, at Neuchâtel, in my house, under my private signature and the seal of my arms, the seventeenth day of September, in the year of grace, one thousand eight hundred and forty-seven (1847.)

L. S.

Signed: I. VAUGNEUX, Notary.

“The great events which have occurred in my country, and the changes that have taken place since this partnership was formed, especially in respect to the persons engaged in the administration of affairs, have induced me to change the destination of that portion of the profits coming to my great and magnanimous associate; and in consequence thereof, and in conformity to the inspiration of his good Spirit, I make the following change in Article 7th:—

The net proceeds coming to my respectable associate, after settlement, if any such there be after my death, is to be remitted, not to the chamber of charity of Neuchâtel, but, on the contrary, to the pastors then in office in the parish of Neuchâtel, to be by them devoted to pious uses at their discretion, some portion to be given to evangelical missions designed to spread the knowledge of the only true God throughout the earth.

I have the confidence to believe that those gentlemen will willingly accept the charge I have assigned to them without consulting them, and that they will

enter into my views, for which I here testify, in advance, my sincere and lively gratitude.

Thus done, written and signed in my house at Neuchâtel, the twenty-fifth of March, one thousand eight hundred and fifty (1850).

Signed: I. VAUGNEUX, *Notary*.

"March 10, 1855. Our enterprise having been blessed, the share coming to my great and magnanimous associate, as it may appear on page 79 of my book (current accounts), and page 60 (account of my associate), is to be paid over, three months after my death or that of my wife, to MM., the pastors, as above named. The executor of my will, my nephew, Frederic Preud'homme, having deceased, it will be the duty of my successors to fulfil the conditions of the existing partnership, by paying over this share to MM. the pastors, if, as I expect, they should be willing to take charge of it, to be invested in the most productive manner, and the capital and income used according to their discretion under the divine inspiration."

A copy of this document was placed in the hands of one of the pastors by the writer before his death. After the widow died it was opened, and the pastors made application to the Council of State, according to the municipal law, for authority to receive the money. This was refused, for the reason, as the Council state, that the paper in question is "the act of a disordered mind." The niece, when she came in possession of the property, fulfilled the wishes of her uncle by making a gift of the money for the purposes he had indicated. This she did out of the high regard she had for him, and gratitude for care and kindness towards herself. She repels with a good deal of warmth the idea that he was insane. "Although he might have been regarded as somewhat original," she says, "yet it never entered into the thought of any one that his reason was deranged. I, who was always admitted to his closest intimacy, know that he possessed all his faculties to the last moment, and I revere his memory as that of a just and upright man." It is also stated that no trace of mental disorder could be found in any of his writings; that his books were well kept, the entries made, the interest reckoned, and the balances got as correctly as possible, all according to the articles of copartnership.

No one can help suspecting, at first glance, that the head of this worthy wine merchant was somewhat turned. The astonishing audacity with which this really religious man associates the Almighty with himself in a mere matter of trade and traffic, the coolness with which he assigns to the partners their respective duties in the concern, and the perfect confidence on the part of one who had been accustomed to legal forms and proceedings, that such a paper would have any legal effect, would certainly justify such a suspicion. But a broader view of psychological diversities of character will lead us to doubt whether the case is not one of those occupying that border land between sanity and insanity which bears the name of eccentricity, oddity. Taking into view the prominent incidents of the case, it may be satisfactorily explained without resorting to the theory of insanity.

Here was a worthy old man accustomed to see the hand of God in every

event of life, and to look to God at every turn for help and direction, about to embark in a new undertaking. Feeling that men must labour in vain without the blessing of God, and feeling it, too, not as a glittering generality, to be coldly acknowledged and then forgotten, but as a vital principle of action directing and controlling every movement, his first thought was naturally to secure that blessing for himself. Both reason and religion assured him that nothing could more effectually accomplish this object than, while working for himself, to work for the glory of God. What more acceptable service could he render than to devote a portion of his earnings to charitable and religious uses? That this purpose may not be lost sight of, that it may be ever kept before him as the sole, animating, all pervading principle of his life, he resolves to recognize and consecrate it in a form the most solemn and imperative. Thus far, surely, there is no trace of insanity. The purpose is worthy of the strongest endeavour and the purest aims, and is steadily and successfully pursued for years. The logic, too, is all correct, without fault or gap. The only thing to which exception can be possibly taken, is the form which he has chosen for the expression of his intentions and motives. This seems to savor of insanity, but it will hardly bear the test. Be it observed that it conflicts not at all with the object proposed, but rather aids and promotes it. It exhibits no trace of delusion or even irrelevance. True, the idea of forming a partnership with God is most extravagant and presumptuous, and the language used is perfectly shocking to a correct religious taste. The presumption, however, is more seeming than real. This old man, having been accustomed all his life to the use of legal forms, with a high opinion, no doubt, of their fitness for the expression of all ideas whatever, not unnaturally, though somewhat pragmatically, chooses them on this occasion. It only shows the force of habit and the narrowing tendency of a professional routine. Any other man having resolved upon accomplishing the same thing in a similar spirit, would have formally declared his intention to devote one-half the profits of the new enterprise to charitable and religious purposes, and reverently evoked the divine blessing on his labours. And he might have opened an account on his books with "Charity Fund," or something equivalent, making the same entries to debit and credit, and directing his executors to pay over the balance that might exist at his decease to some institution or trustee. The document in question exhibits a very common mark of eccentricity—that of saying or doing a very proper thing in a queer, singular manner. In insanity the mental affection as often appears in the design as in the execution. In fact, the latter may be all right while the former is all wrong. We must bear in mind, too, the effect of religious associations and of the prevailing style of religious thought and feeling. That must vary with the moral and intellectual culture, the form of faith, the customary observances, the temperament and spirit. All this must be considered before we can properly estimate the

true pathological significance of this extraordinary contract. Many a prayer and sermon may still be heard, once more frequently than now, indicating a close participation in the counsels of God, and administering advice, suggestion, and even reproof, more befitting a member of a mercantile firm to his associate than a worm of the dust addressing his Creator. In the works of English divines, two hundred years ago, may be found passages relating to the counsels of the Almighty clothed in terms of such gross familiarity that to quote them even would be enough to expose one to the charge of irreverence.

We venture upon one quotation, however, that the reader may see how conventional are all proprieties of speech on sacred subjects, and thus understand that much latitude in this respect does not necessarily imply insanity. It shows very strikingly that such things must be judged not by any arbitrary rule, but by the light of prevailing practices, modes of thought, and forms of expression. It is from Flavel, a non-conformist divine of James the Second's time, whose writings have been held in great repute, and frequently reprinted, even down to our own day. The following extracts are from a sermon setting forth the scheme of redemption, the text being Isaiah liii. 12.

"Having told God how ready and fit he was for this service, he will know of him what reward he shall have for his work, for he resolves his blood shall not be undervalued: hereupon, verse 3, the Father offers him the elect of Israel for his reward, bidding low at first (as they that made bargains use to do), and only offers him that small remnant, still intending to bid higher; but Christ will not be satisfied with these, he values his blood higher than so; therefore, in verse 4, he is brought in complaining, *I have laboured in vain and spent my strength for naught*. This is but a small reward for so great a suffering as I must undergo; my blood is much more worth than this comes to, and will be sufficient to redeem all the elect dispersed among the isles of the Gentiles, as well as the lost sheep of the house of Israel. Hereupon the Father comes up higher, and tells him he intends to reward him better than so, and therefore, verse 6, says, It is a light thing that thou shouldest be my servant, &c. * * * Here you may suppose the Father to say when engaging this bargain with Christ for you:—

"*Father*.—My Son, here is a company of poor miserable souls that have utterly undone themselves, and now lie open to my justice. * * * What shall be done for these souls?

"*Son*.—O, my Father, such is my love to and pity for them, that rather than that they shall perish eternally, I will be responsible for them as their surety: bring in all their bills that I may see what they owe thee, Lord, bring them in all that there may be no after reckoning. * * *

"*Father*.—But, my Son, if thou undertake for them, thou must reckon to pay the last mite, expect no abatements; if I spare them, I will not spare thee."

The feature in the proceeding of Vaugneux which raises the strongest suspicion of insanity is the testator's belief that such dispositions of property would be confirmed by the law. It might be supposed that a person professionally acquainted with the laws of his country would have avoided a mistake so fatal to the fulfilment of his own wishes, and provided for an object he had so near at heart, by measures strictly conformable to law. There would seem, at first thought, to be something in this, but, practically,

such mistakes are too common among lawyers to be a strong indication of mental aberration. M. Vaugneux is not the first nor the last in his profession who has drawn a will that could not be executed, or shaped it in such a manner as to frustrate the strongest wishes of the testator.

In this connection, it is proper to consider another fact that may have had some bearing on this case. The idea of forming a partnership with God did not originate with M. Vaugneux. In the fourth volume of an old collection of *Causes Célèbres*, published in Paris, in 1736, by Jean de Nully, may be found a similar case that was adjudicated in Paris, a few years before. A young Frenchman, named Duhalde, after various unsuccessful business enterprises, "resolved," as he expressed it himself, in his diary, "to form a partnership with God, promising and vowing to fulfil all the conditions, as here set forth, and engaging my heirs, whoever they may be, to execute them, in case I shall die before being able to do it myself." The business of the firm was to be trading in precious stones, and was to continue five years, from 1719 to 1724. By the conditions of the partnership, he was to furnish the funds, 15,000 livres (all he possessed), and God was to bless the enterprise. He obligated himself to form no other partnership during the five years. At the end of this period, the accounts of the firm were to be settled, and, after deducting the original capital, 15,000 livres, any dowry a wife might bring him, and any legacies he might receive, the remainder was to be equally divided between him and God. In October, 1724, when the partnership expired by limitation, Duhalde made up the books and presented an exact account of receipts and disbursements. After making the deductions just indicated, the profits were represented by three collections of precious stones, one of which was in Amsterdam, one in Madrid, and the other in Paris. The last-named he placed in a packet and marked it, "*Half for the Poor*," and at the foot of the account, he wrote the following words:—

"Cursed be my heirs, whoever they may be, if, under any possible pretext, they withhold from the Poor half of the proceeds of the sale of the stones above-named, in case I die without executing my own wishes. And if by some extraordinary chance, my fortune shall be reduced to this single amount, let it be considered as a sacred trust which is to be sacredly paid."

Duhalde died shortly after, leaving a wife and child, and the "Hôpital Général" claimed of the executors of his will the portion of stones indicated to be given to the poor. The widow, by her counsel, resisted this claim, chiefly on the score of some legal objections drawn from the provisions of the Coutume de Paris respecting wills, whereby the contract and its results were shown to possess no legal validity. Another objection, extra legal in its nature, was that in this arrangement there could be created no obligation on the part of God. A partnership supposes equal and reciprocal obligations. Even Duhalde himself was not obligated, for he had not signed the articles of partnership. This very objection was urged in the Vaugneux case. The fact was also stated that Duhalde was a very

singular man, with odd, strange ways; but it does not seem to have been contended that these mental peculiarities amounted to testamentary incapacity. By the counsel for the will, one of whom was the son of the celebrated Chancellor D'Aguesseau, it was contended that there was nothing in reason or Scripture to forbid the idea of a contract with God. He contributed nothing directly to the funds of the firm, but was not the testator indebted to him for the capital on which he started? Considered as a contract with God, the present case is not without precedents in the dealings of God with man. Did not the Lord make a covenant with Abram, whereby the latter, in reward for his fidelity, obtained the land of Egypt for his posterity? Did he not also make a covenant with Noah, promising never again to cut off all flesh by the waters of a flood, and to place the bow in the cloud as the eternal seal of the promise? The sacrament of baptism, too, is not that in the nature of a contract with God? Will it be said that this being a contract for spiritual purposes has no analogy to a business partnership like Duhalde's? But what was the animating spirit of the latter? Was it not the love of God and our neighbour? Was not the object of this connection a purely spiritual good? In thus renouncing his earthly goods, and associating himself with the Almighty, did not Duhalde form a more perfect union with God? The court, governed solely, it may be presumed, by the legal considerations, decided in favour of the will.

It can scarcely be doubted that Vaugneux's professional studies had made him acquainted with this old case, because the collection in which it is contained is well known to every French lawyer. It might have suggested to him the bold idea of associating himself with God, and the decision of the court would have removed any doubts respecting its legality.

In consideration of all the circumstances necessary to be considered, we can scarcely hesitate to believe that this testator can be charged with no mental defect equivalent to insanity, and was competent, of course, to devise his property as he did. Had he, on the contrary, as Dr. Chatelain, who reports the case, observes, completely disinherited his heirs, who had a moral right to rely on his bounty, then the case might have borne a different construction.

ART. VI.—*Wakefulness; Sleep; Anæsthesia.* By S. HENRY DICKSON, M. D., Professor Practice Med. in Jefferson Med. Coll., Philadelphia.

THE changeful conditions of the brain and nervous system are the most important topics doubtless of biological research. As specially familiar and interesting, healthy sleep and its opposite or contrast, morbid vigilance—insomnia—have undergone frequent inquiry and discussion.

Two among the recent essays on these subjects have attracted particular notice ; Durham's, in England, and Hammond's, in our own country. The former is, indeed, often referred to, not only as of the highest authority, but as having shed new light on disputed points by his experiments. This admission of originality will surprise those who are acquainted with the observations of Blumenbach, Dendy, Combe, Donders, and others who have in everything anticipated him.

Prof. Hammond's ingenious brief Treatise on Wakefulness merits our careful attention and comment. His views are always entitled to respect, and from his deserved popularity as a writer and experimenter, are widely received. They should, therefore, if erroneous, be watchfully corrected, and I shall make no apology for such critical examination of his facts and reasonings as may seem called for as I proceed.

Vigilance and sleep being correlative, must be considered together as mutually illustrative of each other. We are conscious that the brain is most active when we are awake, yet Dr. Hammond calls sleep, as Broussais also did, "a function" of the brain. It would seem nothing less than a contradiction in terms when he says afterwards, that "for the brain there is no rest except during sleep." An organ cannot possibly be at rest while engaged in the performance of a function. If sleep be a state of rest, it is, on the other hand, a vicious phrase and a solecism, to speak of the "exciting cause of sleep."

He lays down, without qualification, the dogma that "Force is only generated by decomposition." Now it is true, as he affirms, that "every motion, pulsation, thought, is accompanied by the destruction of a certain amount of tissue;" but this destruction is effect or concomitant, not cause of the living action, whatever it may be. Volition is a force in the most emphatic sense ; its energy or impulse is the direct cause of many actions, upon which destruction of tissue is an unfailing attendant or consequence. Surely no one will ascribe Volition, as a Force, to any mode of decomposition—causative or precedent to its exertion. "Use causes decay," doubtless, but he must be aware that it is necessary to growth and development : parts disused fall into atrophy.

There is an evident incompatibility in his holding sleep to be a cerebral function, while he endeavours to demonstrate that the brain is anæmic in the state of sleep. "It is well established," he contends, "as regards other viscera," that there is more blood in their tissues in a condition of activity than when they are at rest. Strange that the contrary doctrine, relative to the brain, should have prevailed so long." But he forgets that it is not only "in a condition of activity that there is more blood in the tissues" of an organ than the normal amount. Congestion, as a passive hyperæmia, is most unfavourable to the activity of any organ, and, when in high degree, certainly suspends it.

A large supply of blood is necessary when the function of a viscus or

tissue is to secrete; but the office of the brain is not secretion; it is not a gland. It demands a proportion of the circulating fluid sufficient to nourish it, to vivify it—to excite it by the vital air with which it supplies it; but it requires no surplus, as a *gland* or *secreting surface* does, to furnish the amount requisite for its separation of useful or effete material for service or elimination. It is clear that we must discriminate here. A muscle in action, by the very fact of its contraction, must contain less blood at the moment than when in repose. How much of the locomotive force is generated by the destruction of the muscular cells is uncertain. The experiments of Wislicenus and others have proved that it is not exclusively produced in that mode. Certainly it does not come from the blood within the vessels of the muscle. So, in order that the function of the lungs should be duly performed, there must be a definite proportion between the blood flowing into and through them from and to the heart, and the air admitted by the respiratory tubes. It would not be safe to affirm that “there is more blood in their tissues in a condition of increased activity, than when they are comparatively at rest.” Such hyperæmia would embarrass and obstruct them. The current moves faster—the propulsive energy of the heart is excited with more rapidity, but neither the heart nor lungs contains, at any instant, more blood than when at rest. Nay, the contrary is probably true; for a greater force of inspiration is resorted to by the gymnast, and the heart is too much hurried in its alternate systole and diastole to be capable of large dilatation, either in its cavities or intimate tissue. Prof. Hammond has not stated the proposition in the form offered by his opponents. They have not affirmed “the contrary doctrine” to that which he has pronounced too hastily, as universally established. No one contends that in a state of normal activity there is less blood in the brain than in sleep or when it is resting. The view taken is this: that it is differently distributed, the quantity remaining, of necessity, the same; a point disputed and denied both by Hammond and Durham, who maintain the ancient doctrine of actual collapse of brain. In sleep the arteries of supply contain less—the veins being turgid; in the waking state, the proportions are reversed, as I shall attempt to show; neither anæmia nor hyperæmia being manifest.

No therapeutical opinion, no practical prescription is more common than that which is founded on the belief that opium is a hypnotic; that it induces sleep. In the very teeth of this time-honoured and almost universal faith, Dr. Hammond informs us that “no agent so distinctly points out the difference between sleep and stupor as opium;” intimating clearly enough that this admirable drug simply stupefies: yet “not by any direct action on the brain; all its effects are due to its influence on the heart and bloodvessels, through the medium, however, of the nervous system.” But on what part of the nervous system, exclusive of the brain, does it act—and what is the nature of its direct action? Its ultimate “influence on

the heart and bloodvessels," I contend, is to diminish the force of the ventricular systole and the arterial impulse, while the auricles and veins are flaccid, yielding, and more or less turgid.

There is no antithesis, no marked dividing line between sleep and stupor. "Coma and sleep are by no means identical." Dr. Hammond asserts roundly that "stupor is morbid, never occurring in health, while sleep is a necessity of life. In sleep the mind is active, in stupor, as it were, dead."

It is not easy to say upon how many disputed questions a dogmatic decision is here laid down. The words "coma" and "stupor" are employed interchangeably, as if they expressed the same meaning. Coma is always used, by English writers, in a morbid sense; stupor, and its correlatives stupid, stupefy, stupidity, occur in familiar language and conversation, without the slightest reference to disease. Degrees of comparative insensitiveness in sleep, present themselves daily and hourly. The light slumber, disturbed by a breath or motion, of so many sedentary and studious individuals, offers a strong contrast to the sleep of the tired sentinel on his post, of "the sea boy, on the high and giddy mast," the soldiers of Sir John Moore on the retreat to Corunna, the powder-monkeys during the battle of the Nile, and of Dr. Hammond himself in the saddle. Now, if the word *stupor* has any special meaning, it will be found difficult to separate these and other (not rare) cases of profound sleep, from stupor. If a patient cannot be aroused, he is comatose or dead. He can be aroused from sleep, however deep or stupid, and every one must know dense, stolid, snoring sleepers, whom it is very difficult to arouse. Many agents, the effect of which will not be denied to be in the truest sense physiological, give rise, when intensified, first to sleep, and then to stupor. Cold does this most remarkably, and we all remember with what effort Dr. Solander was saved against his will, being resolved to indulge his strong inclination to sleep. Heat, as in one of the most common forms of sunstroke, induces similar symptoms. General Sir C. Napier, describing his sensations when thus attacked in India—the only survivor among many assailed at the same time—says, "I was just deadly sleepy; a tiredness like that of being suddenly waked before time, to a degree almost to be called pain; then a pleasant drowsiness, with anger at being disturbed." Wine and alcohol dispose to sleep, then to stupor. Coma and apoplexy will follow in all these cases, if the vessels become parietic, or yield and pour out their contents on the brain.

But the question concerning opium is worthy special consideration. Taylor, in his excellent work on Medical Jurisprudence, makes use of expressions significant and full of proper discrimination. "The symptoms which manifest themselves when a large dose of opium has been taken, are, in general, of a uniform character. They consist in giddiness, drowsiness, a strong tendency to *sleep, stupor*, succeeded by perfect insensibility, the

person lying motionless, with the eyes closed as if in a sound sleep. In this state he may be easily roused by a loud noise, and made to answer a question; but he speedily relapses into *stupor*. In a later stage, when *coma* has supervened with stertorous breathing, it will be difficult, if not impossible, to arouse him. The pupils are, in the early stage, contracted; in the later stage, and when progressing to a fatal termination, they may be found dilated." It is evident that the words *stupor* and *coma* are here used to mean very different conditions, and that drowsiness, sleep, *stupor*, are regarded as degrees of effect, beyond which the transition to *coma* is marked. Not only do we find the general appearance of the individual under the influence of a moderate dose of opium closely to resemble that of one simply asleep, but we have here the condition of a sensitive organ shown to be precisely the same. "In sleep," says Mayo, "the pupils are contracted." Graves tells us that "having opened the eyes of two patients who lay soundly sleeping in the fever-ward just under one of the windows, we found that the pupil was contracted to the size of a pin-hole. It remained in this state for a while, and then expanded when they awakened."

After the convulsion is over in an epileptic paroxysm, the patient falls into sleep or *stupor*—not *coma*, for he can be aroused. If *stupor* at first, it subsides into natural sleep, provided the patient is not disturbed. I had the misfortune to be sitting alone with a subject of epilepsy when she was attacked. It required all my strength and attention to save her tongue from being bitten, and prevent her injuring herself otherwise. While thus occupied, and when she had sunk into quiet, a friend came in, and seeing her flushed visage and foaming lips, ran out and returned with a pitcher of water, which she threw into the face of the sleeper, who, thus aroused, was at once seized again with a convulsive paroxysm much more violent than the first.

Coma may, as far as I am aware, always be distinguished by a dilated pupil which is insensible to light, and this whether it be an instance of *coma somnolens*, or of the rarer *coma vigil*—the Korubantian of the Greeks—the "Wake-sleep Curse" of Aristophanes, so translated by Mitchell in "The Wasps"—"sleeping with the eyes open." This would seem to be a state somewhat analogous to that of the somnambulist, the pupils of whose eyes do not respond, we are told, to the influence of light in the usual way. "Her eyes are open, but their sense is shut," says the universal Shakspeare.

Dr. Hammond's own experiments prove the hypnotic power of opium. They only suggest the doubt whether this is an indirect or direct influence. Opium being administered to two dogs—to one in large, to the other in smaller dose—artificial respiration was kept up for some time, the animals having been trephined. "The brain became collapsed, and they fell into a sound sleep, from which they were easily awakened." If the artificial respiration was stopped, "the surface of the brain became dark, and *stupor*

resulted in the one to which the large dose was given." Hence he infers that black blood produces stupor, which, if the blood be properly vitalized, is sleep, each with collapse. "A small dose of the drug acts as a stimulant: a larger dose lessens the amount of blood in the brain, and induces sleep." But *how* does it lessen the amount of blood in the brain? This is the very question of fact before us, and unless it can be proved as fact, or inferred necessarily from the *modus operandi* of the medicine, should not be thus positively affirmed. The violence done to the animal, and the unnatural condition of the skull and its contents, render the apparent sinking of the mass—collapse as he terms it—entirely useless as establishing his position. "A very large dose allows blood not properly subject to the influence of the oxygen of the atmosphere, to circulate through the vessels of the brain, but with a diminished amount of blood in its tissue; complete stupor followed for two hours, sensation was abolished, and motion lost." Here we have the element of quality of blood added, and no longer ascribe the effect to mere subtraction of quantity. So in the experiment: "A large dose (5 grains) of opium was given to a trephined dog, and artificial respiration instituted. The brain was first congested, then collapsed, and sleep ensued, which was sound, but the animal was easily awakened. After an hour and half the nozzle of the bellows was removed. The vessels of the brain were filled with black blood; the dog could not be roused, and died in an hour and a quarter." He goes on to argue that "the condition of the brain is thus shown to be very different during stupor from that which exists during sleep. In the one case its vessels are *loaded* with dark blood; in the other they are comparatively empty, and the blood remains florid." But he forgets that he has presented to us his No. 3 on p. 20, in complete stupor for two hours, "with the surface of the brain dark, almost black, and *sunk below* the level of the opening, showing a diminished amount of blood in its tissue." Thus we have stupor in the contrasted states—"the vessels loaded"—and with "diminished amount of blood." It would seem probable that we here find an explanation of the effect of chloroform, which is by no means a true hypnotic, but asphyxiates its subjects—who fall into transient coma, or die after becoming insensible, from the effect of black blood—carbonized or non-oxygenated—into the cerebral vessels. In all the experiments and observations reported where the condition of the brain under chloroform or ether could be seen, its vessels were filled with black blood. In trephined subjects the cerebral mass would escape from pressure by protruding at the orifice; the stupor or coma, and insensibility, are not then produced by pressure—by quantity of blood, hyperæmia, or congestion, but by its quality or poisonous character.

If anything be here proved, it is the truth of Blumenbach and Playfair's opinion, that sleep is due to a diminished supply of *oxygenated blood* to the brain. And there can be little or no doubt of the fact, whether it

be causative of sleep or not, that the supply of *arterial* blood is diminished. But it is diminished coincidently with, and not merely because of the collapse, which is an undescribed state of the cerebral tissue. I hold it to be an unmeaning term as applied here, and entirely inappropriate. The brain has its vital properties peculiar to itself, and essential to the performance of its wonderful and mysterious functions. It has, in all its parts, an active capacity, which is excited by volition and under other contingencies; and it reposes passively. The former vital state we may call its excitement, its erethism, usually concentrated, rarely diffused. It is denied, and has not been proved, that the rapid changes from activity to repose, from emotion to tranquillity, from stormy passion to quietude, from intellection to reverie, from sleep to waking—I say it is not proved that these changes are attended with any corresponding changes of *bulk* in the great ganglia which fill the hard-walled cavity of the cranium. Indeed, it seems to me impossible that such abrupt variations in the dimensions of the soft mass should occur. The contents of the cavity are fluid and solid. The latter must remain with little alteration of size from moment to moment in health; the former may undergo indefinite modification in their distribution in the promptest manner. Erethism of the organ, or any portion of it, solicits and obtains determination thither, of arterial oxygenated blood—wakefulness and activity are attendant or consequent. The erethism ceasing, the veins become turgid, and the subject sleeps. Draper has settled the question as to determination of blood, the active form of hyperæmia, that it is the result of a *vis-à-fronte* affinity for the vivific oxygenated blood of the nutritive arteries of the part.

To observe the condition of the brain *in healthy sleep*, Mr. Durham trephines a dog, cuts away the dura mater, and stupefies him with chloroform. “To obviate any possible effect due to atmospheric pressure, watch-glasses were applied to the opening in the skull, and securely cemented at the edges with Canada balsam.” Looking through these glasses, Mr. Durham found that “during sleep the brain is in a comparatively bloodless condition, and the blood in the encephalic vessels is not only diminished in quantity, but moves with diminished rapidity.” When, therefore, during the sleep of the trephined animal, “the brain became pale, and sank below the level of the bone” where the watch-glass was fixed, if the fitting was perfect and no air entered, and no fluid was effused, there must have been between the concave surface of the glass and the flattened convex of the denuded brain an absolute vacuum—a result entirely inconsistent with what we have learned of natural philosophy. On the other hand, if the fitting was not perfect, or if air was generated in the unnatural state of the parts, after the application of the trephine, the administration of chloroform, the cutting away a portion of the dura mater, and the adaptation to the wounded scalp of watch-glass and Canada balsam, the pressure by this air

would drive away blood, thus condensing the cerebral mass, and producing, as we see, stupor and coma.

Further on, Prof. Hammond quotes Mr. Durham as saying that "the blood which is derived from the brain during sleep is distributed to the alimentary and excretory organs." This would surely be inconsistent with the received and reasonable opinion that the sole use and final cause of sleep is the restoration of the brain and nervous system, and that during sleep this great organ recruits itself, and regains its vigour and capacity of action. Such restoration would and does require a full supply of blood to its nutrient arteries, without which its losses must be irreparable. Collapse of brain, then, in the sense of loss of bulk or diminution of due supply of blood, is impossible.

Three states of the cerebral mass—or of its various parts in succession, for it can hardly ever be supposed to be in a uniform condition throughout, numerous and varied as are its important functions—three states of brain may be recognized: *erethism*, with large supply of arterial blood in the waking and active hours of thought, feeling, motion; *repose*—the Turkish "kief," tranquillity—an equipoise of venous and arterial fulness; *sleep*, with venous turgidity, and due nutritive supply of blood to the whole mass, but, if the sleep be perfect and profound, no erethism or local determination of arterial blood. To assist in the readiness with which these changes may and must take place in health and its rapid vicissitudes, the cerebro-spinal fluid, the importance of which was first dwelt on by Magendie, seems to have been provided. This subsides into the vertebral tube when the vessels of the brain are full, and when any sudden drain is made upon them may rise, under atmospheric pressure (from which that canal is not fully protected), in some measure and quantity, up into the cranial cavity.

Wakefulness, then, I hold to be the activity of the brain, or any considerable portion of it; in health, under cerebral excitement or erethism, which keeps up the presence of a certain proportion of arterial oxygenated blood, and thus prevents the passive pressure of the due proportion of darker venous blood. In disease such excitement may be inflammatory or neuropathic. Or, if Solly be right as to certain cases of delirium tremens of which sleeplessness is emphatically characteristic, there may be true anæmia cerebri, with similar defect of pressure from venous blood; the defect of mass being made up by accession from the cerebro-spinal canal, or perhaps effusion enough just to balance the bulk or quantity, without adjusting the requisite proportions.

I do not think it difficult to prove that such venous turgescence coincident with arterial subsidence—leaving no vacuum, because of its due correspondence—and combined with the opposite state to erethism of cerebral substance, which I am unwilling to call collapse, as I do not believe in nor admit any shrinking of bulk of the brain—these *two elements together* are necessary to the invasion of sleep.

We lie down to favour the easy flow of blood to the head, and to retard the return by gravitation. Whatever mechanically determines the same conditions favours sleep—swinging; sailing; rotatory motion, an irresistible form of which is said to be the whirling round as on a wheel, with the feet to the centre and the head to the circumference.

Fatigue produces sleep by weakening the muscular force of the heart; the arteries convey with less energy upwards, and the veins return the blood with corresponding languor. We are not yet prepared to estimate the claims of ophthalmology in general pathology and therapeutics, but I find in the *British and Foreign Medico-Chirurgical Review* for Jan. 1868 a remark which I will introduce here, as bearing on my subject, *quantum valeat*: “Dr. Hughlings Jackson has published an important paper upon the retinal circulation as seen with the ophthalmoscope during sleep. He desired to obtain in that outpost of the cerebral circulation some evidence of the variations of vascular tension in both health and disease. He found, on examining the eye in natural sleep, that the optic disk was white, the artery a little smaller, and the veins thicker than in waking.”

Prof. H. quotes me partially. I do not regard “an increased determination of blood to the cerebral mass, and its consequent congestion in the larger vessels of the brain, as necessary to the induction of sleep.” I am, on the contrary, fully persuaded that there is rather less than more *arterial* determination to the brain when its waking activity declines, but that there is *venous* distension—a form of congestion, if you please—which compensates for it, and gives the pressure which Carpenter and Holland, among a host of other physiologists, consider to be the necessary and immediate cause of sleep. The context explains the use intended of the word “determination”—for retention in the veins. If this mode of local hyperæmia be not the *causa causans*, it is certainly the *causa sine quâ non*—a condition indispensable; and I prefer to view it in this light.

He affirms that “excessive loss of blood produces sleep.” Syncope and convulsion follow hemorrhages, not sleep. A condition of exhaustion may readily be mistaken for drowsiness. There is some complication in his views concerning this point, as in the distinction he offers between active and passive insomnia. “If the cerebral vessels of a healthy brain contain a pint of blood, and the amount be increased to a pint and a half, a state of *active* insomnia ensues. If, on the other hand, this pint should be reduced to a gill, and then increased to half a pint, a condition of *passive* insomnia would be produced; the latter condition resulting, not from a disturbance of the normal relation existing between the intra- and extra-cranial blood, but of that which has been established by morbid causes, and to which the organism has become habituated.” The meaning of this last sentence is not clear; but it would intimate that Dr. Hammond has thrown off all the old superstitions concerning “nature’s abhorrence of a vacuum;” or that he believes in the capability of the skull or of its con-

tents to expand and contract, with a readiness and to an extent hardly equalled in Piorry's spleno-hypertrophy. It is possible to conceive of a distinction between active and passive vigilance; the former being shown in mania and febrile delirium and the like, the latter in Solly's anæmic delirium tremens. Sir Benjamin Brodie speaks of "a morbid condition of the nervous system which is incompatible with sleep." This, and not anæmia, I believe to be the true solution of the wakefulness of the habitual drunkard. It resembles "the fidgets" of which hysteric women and nervous men complain—an irresistible and intolerable restlessness; a most distressing sensation.

Dr. Hammond errs most palpably when he pronounces "that those positions of the body which tend to impede the flow of blood from the brain, and at the same time do not obstruct its passage through the arteries, while causing hyperæmia, also produce insomnia." The exact opposite of this proposition is true, and we have here a strange substitution of some exceptional cases for an almost universal rule. All the world lies down to sleep, the horizontal posture not only resting the limbs, but tending to diminish the flow of blood from the brain as far as the subtraction of the force of gravitation will do this, while the passage through the cerebral arteries is even rendered easier by the same influence. Thus, blood flows gently and readily into the head; glides unobstructed through the quiescent tissues, nourishing them, and restoring their waste and wear; also dilating the full veins which moderately press upon the soft and yielding organ, the general mass of which is passively in repose. Yet all sleep is probably partial; and here and there a dream may arouse for a moment a greater or less portion, which shall fill with red blood, and change its aspect as the surface of a lake is rippled under a passing breeze.

I will not dispute the assumption that "variations in the amount of blood in the brain are principally dependent upon nervous action." It would not perhaps be difficult to prove that all vital changes are primarily dependent upon nervous action; and we cannot doubt that such action varies perpetually there, as on the surface and in the viscera; the distribution of blood, the proportion of the arterial and venous, being easily altered. But, from the very nature of the case—the unyielding hardness of the skull, and the comparative, indeed nearly absolute independence of its contents on the influence of atmospheric pressure—such "variations of amount" as occur elsewhere are physically impossible. The disputes and experiments of Burrows, Kelly, and others seem to prove that it is possible, by extreme measures, to derive in some degree from the vessels of the head; but the slowness and difficulty of such derivation I suppose to be universally admitted. The highest living authority in medical jurisprudence, Casper, professor of forensic medicine at Berlin, accustomed to the use of precise and careful expression, repeatedly notices, in cases of the largest losses of blood from wounded bodies, the retention of blood in the

veins of the cerebral circulation. Thus he says (vol. i. p. 123, Sydenham edition) of a man stabbed in the back: "The body was of a waxy white, and perfectly anæmic, the only exception being the veins of the pia mater." Again (p. 192), of the autopsy of another murdered subject: "The body was generally anæmic, excepting only, *as usual*, the cerebral veins." There had been a penetrating wound of the heart, of course with great hemorrhage. And, treating of death from hemorrhage, he warns us—"The inspection exhibits total anæmia, or at least great deficiency of blood in all the large venous trunks, except the veins of the pia mater, which are rarely empty, or even strikingly anæmic, but are generally visibly filled with blood. *This fact is constant*, and must be ever remembered, lest in some cases a difference of opinion should arise as to the death being really due to hemorrhage, because the cerebral veins are still visibly full of blood." (vol. ii. p. 2.)

Hence we read without surprise—although in positive contradiction of his own assertion that "excessive loss of blood produces sleep"—Dr. Hammond's interesting case of a lady suffering from long-continued wakefulness, "who had lost a good deal of blood, and was in consequence greatly reduced in strength." If the brain be drained by hemorrhage, as he supposes, and if anæmia of the brain involve collapse of the organ, which, as he and Durham suppose, is sleep, or brings sleep, it is difficult to see why this patient remained vigilant. But if her nervous system laboured under that indefinite form of excitement suggested by Brodie as "incompatible with sleep," and if, as is established, the brain cannot be drained of blood, there would be an undue proportion of it detained in the arteries, or attracted thither by the affinity to which Draper ascribes "determination of blood" exerted by the cerebral tissue in the state of erethism.

A few words may be permitted in reference to the effect of pressure upon the carotid arteries, a topic which I have fully discussed elsewhere.¹ Pressure upon the artery is in no degree *hypnotic*, as Fleming has ventured to affirm. I speak with absolute knowledge, having for an ordinary lifetime been in the habit of relieving my headaches by this measure; for the suggestion of which let the name of Parry, of whom neither Fleming nor Hammond take the slightest notice, be ever gratefully remembered. Pressure, interfering with the flow of blood through *the artery*, and *this only*, produces, never sleep (which is much to be regretted), but a sense of sinking and unconsciousness. If it also affect the nerve with the artery, there will be some laryngeal irritation and dyspnœa. If the vein be included, stupor and coma will be induced, preceded by dimness of vision and vertigo. In my own person the first effect of compressing the artery is upon the heart, whose pulsations become less frequent; the force as well as the frequency of the cephalalgic throbbing abates. After a while the

¹ Studies in Pathology and Therapeutics.

heart beats with its usual rhythm, but the painful impulse of the current is still controlled.

Finally—concerning the relief of this distressing condition—of Wakefulness, Sleeplessness, morbid Vigilance. As a general proposition we may lay down the rule, that nothing more is required than the removal of its exciting cause: “*Causa sublata, tollitur effectus;*” the ordinary degree of fatigue, resulting from the habitual activity of mind and body, will induce the regular and periodical return of “nature’s soft restorer.” But it must not be forgotten that causes are of two kinds; those which act by positive perturbation, thus directly preventing sleep, whose abstraction, therefore, will be followed at once by repose; and, secondly, those which act indirectly by bringing on “a state of the nervous system incompatible with sleep”—to employ again Brodie’s apt phrase. Dr. Hammond has enumerated several of the methods by which we attain the removal of the first set of discordant agencies—the diversion of the mind from agitating trains of thought—the protection from light and noise, &c. Here, also, we may collate many medicines and remedial applications. Venesection, cathartics, pediluvia, douches, may all thus prove soporific; nay, I have known a patient go soundly to sleep under the infliction of a blister, which diminished, as a counter-irritant, the severe pain that had kept him awake and fatigued him. Thus camphor, and digitalis, and quinia, and, as we are assured, bromide potass., will sometimes put to sleep; and alcohol, and ether, and chloroform, not only stupefy or *comatize* (we need the word), but indirectly afford true sleep.

I am fully satisfied, however, that nature offers us but one hypnotic—opium alone. A man in good health, on taking an appropriate dose of the juice of the poppy, under any ordinary circumstances, will become drowsy, and fall into a slumber, not to be distinguished from his familiar sleep, from which he will awake spontaneously, or will be easily roused, and regain at once the usual possession of all his faculties. If the dose be increased so as to pass the physiological line, he will show a degree of dulness, of stupor perhaps running into coma, from which it will be more or less difficult to rouse him, and after which he will suffer headache, nausea, &c., or perhaps die from exhaustion or paralysis of the nervous tissue.

We are all aware of the great difference of personal susceptibility to opiate influence in different individuals: one yields to a small dose; another requires a larger; one is affected much more quickly than another; but the effect of the drug is as uniform and unfailing as that of any agent known to us. Every human being, in the usual state of common health, may be put to sleep with an opiate. Disease modifies this aptitude. Tetanus and hydrophobia defy our hypnotic; delirium tremens, and some forms of mania, resist it strangely.

The crude exudation from the papaver contains many elements, most of

which exhibit its peculiar virtue. Da Costa has recently denounced narceia as useless, and so I myself have found codeia. All modes of preparation of opium, Sydenham's, Battley's, McMunn's, all solutions of morphia begin to act in about the same period of time when taken into the stomach, forty to sixty minutes, reaching the acme in three or four hours as anæsthetic, but persisting much longer as hypnotic, often acting powerfully after the lapse of eighteen to twenty-four hours.

What I have thus asserted of opium is not true—it is not claimed to be true, so far as I am aware—of any other article of the *materia medica*. There is no such absolute unequivocal soporific quality in any one—neither the hop, nor the lettuce, nor belladonna, nor any other so-called narcotic. Useful as they undoubtedly are in numerous forms of disease, they will not—as opium will, in *every varied mode of administration*—put to sleep a healthy adult, or render him irresistibly somnolent under his ordinary conditions of active life or of ultimate rest; they will not overcome, as opium will and does for hundreds every day, familiar degrees of bodily pain and mental distress; “covering as with a large cloak,” exclaims the sage Sancho Panza, “our cares, our sorrows and our sufferings, at least for a blessed interval of tranquillity.” Sydenham could not restrain his enthusiasm—nor will I: “Non mihi tempero, quin gratulabundus animadvertam, Deum omnipotentem, humano generi in miseriarum solamen concessisse hoc remedium;” and a little farther on—“jam laudatum medicamentum, ut sine illo manca sit ac claudicet medicina.” Without this great and useful boon our therapeutics would indeed be crippled both in hands and feet.

The hypodermic injection of opiates is an immense improvement in our employment of them for the relief of suffering. Analgesia, the abolition of pain, is not attainable under the ordinary methods of prehension, in less than from half an hour to an hour at the least: the transition thus effected is magically abrupt, and almost immediate. In my personal experience not more than from three to eight minutes have elapsed after the minute dose of morphia has been thrown into the cellular tissue—varying thus much under somewhat varied intensity and protraction of neuralgic paroxysms—to mark the happy contrast between insupportable agony and a delicious languor unconscious of pain.

But this acceleration of anaesthesia does not extend to the hypnotic influence of morphia exhibited hypodermically. The access of sleep has not been hastened, either in my own case, or in any other within my knowledge. Thus we clearly separate anaesthetics from soporifics, or rather the analgesic influence from the hypnotic. In both, our most invaluable drug is pre-eminent, as it is distinctly separable from the large class of mere narcotics.

Nor can I consent to the common arrangement of opium among stimulants properly so called. In a small dose Dr. Hammond affirms it to be a stimulant. The opium-eater sinks into wretched prostration, both of mind

and body, without its support. Thus there would seem to be plausible grounds for the received opinion. But I have so often employed the medicine for myself and for my patients, without perceiving the slightest or most transient effect upon the heart's action, or in any other way as an excitant, and have so often felt consciously, and carefully observed in others a calming, subduing, tranquillizing influence from the very earliest moment in which its efficiency became notable, that I have never believed it to be of itself, or directly, stimulating in any degree. The opium-smoker subsides at once into dull passive languor. And now we have, in the hypodermic method of administering it, the experimentum crucis. So far as I have experienced and noted its effect, it is promptly depressant; and even the mental exhilaration consequent upon sudden transition to ease from torture, cannot disguise the sense of sinking and prostration which mingles with the joy of relief.

ART. VII.—*Secondary Hemorrhage, Tetanus, &c., after Incisions of Cervix Uteri.* By J. C. NOTT, M. D., New York.

IN the present fragment I propose simply to call the attention of the reader to a few detached facts which I deem of practical interest to those engaged in the special department of uterine surgery. And, first, a few words in relation to *secondary hemorrhage* following incisions of the cervix uteri, whether by the uterotome of Simpson, the knife of Sims, or scissors.

It is conceded on all hands that these hemorrhages are very perplexing when they *do* occur, and that without great caution in the manner of making the incisions, and in dressing them, troublesome hemorrhages often *will* occur. The loss of blood may not only go to an alarming extent in women of robust constitution, but the consequences are much more to be dreaded in broken-down anæmic subjects who can illy spare an ounce of blood, a class of cases by no means rare.

Dr. Sims seems to regard these hemorrhages without dread, but directs, if bleeding follows immediately upon the operation, that the wound should be well plugged with a wad of cotton steeped in dilute persulphate or perchloride of iron, and then a firm tampon of cotton upon this. He does not fear secondary hemorrhage when such dressings are well applied.

Dr. Emmet is still more cautious; he treats every case operated just as if hemorrhage had already occurred; whether there is bleeding or not, he, by means of alum-water and cotton, tampons the wound and vagina thoroughly at once so as to guard against hemorrhage, which experience has taught him very often occurs not only hours but days afterwards.

Now I am free to confess that my experience is much more limited than that of either of these distinguished gentlemen, and that they are more dextrous than I am in tamponing the vagina and preventing subsequent hemorrhage; but still it is difficult for me to conceive that exceptional cases may not occur which will resist the styptic and tampon as applied above. Sometimes an artery (as I have seen) of considerable size passes across the track of the cut, and there being no bone or resisting body behind, against which firm pressure can be made, it is easy to comprehend that a case may occur which will resist any pressure that is likely to be applied. Such examples have, unfortunately, occurred to me, and I will illustrate the point by the following case:—

Mrs. H., the wife of a respectable clergyman, came to Baltimore, where I was then residing, in February last, to consult me. She was aged 33; was mother of four children, the youngest two and a half years old. She had excessive ante flexion of uterus, dysmenorrhœa from mechanical obstruction, hypertrophic engorgement of cervix, great derangement of nervous system, and shattered constitution.

Assisted by Dr. D. J. McKew, of Baltimore, I divided the cervix backwards, together with internal os, as directed by Dr. Sims, with the view of straightening the outlet, and the two subsequent menstrual periods have passed off without pain or trouble of any kind. The uterus being low in the pelvis, and the vagina capacious, the cervix was easily brought into full view, and all the steps of the operation executed and watched with great facility.

I waited some twenty or thirty minutes after the operation, and, seeing no appearance of undue bleeding, I proceeded to apply the dressings. A piece of patent lint soaked in glycerine was forced firmly into the divided os internum (which had been very superficially cut), the divided lip was plugged with a wad of cotton wet with liquor subsulph. ferri (one part to three of water), and a firm tampon of dry cotton was then placed over the whole. I waited a full hour to see that no bleeding followed, and, all seeming quite secure, took my leave to visit other patients. Hemorrhage came on a few minutes after I left, and it was more than two hours before I could be found and brought back to the case; in the mean time she had bled profusely, and I found her pulseless, blanched, and retching incessantly; they had been giving stimulants, but everything was immediately rejected. Her condition was truly perilous, and it probably would have cost her life had I been driven to the necessity of exhausting her remaining strength by removing the tampon and of applying new dressings. The blood was still welling up steadily from beneath the cotton.

I then resorted to the following expedient, which had served me a good turn in a similar case. I took one ounce of Squibb's liquor subsulph. ferri with three of water, and, by inserting the nozzle of a syringe well down to the bottom of the vagina between its wall and the mass of cotton, injected the whole four ounces while pressure was made upon the vulva to prevent its escape. The pressure was kept up for about five minutes to allow the blood to coagulate, after which not a drop of blood escaped.

The patient was much exhausted, and vomited everything immediately. I gave hypodermically one-third of a grain of sulph. morphia, which acted like magic; in ten minutes reaction took place; she slept for two hours

and woke up comfortable; stomach quiet and able to take beef-tea, &c. The case afterwards did well.

Some of my readers will remember a typical case of dysmenorrhœa caused by obstruction from flexion, I published with diagrams in the July number for 1867 of this Journal. Hemorrhage occurred in the same way in that case, and was relieved by precisely the same treatment.

These cases are always alarming, and so solid is the mass and firm the compression produced by the cotton and iron that I do not believe any case can resist it. When we reflect that every crevice in the vagina and neck of uterus left by the cotton is perfectly filled with blood, and that the iron when thrown in as directed forms with the blood and cotton a perfect mould as hard almost as cement, it is difficult to imagine how hemorrhage could continue; and I believe almost *any bleeding wound* could be advantageously treated in the same way when there is difficulty in ligating an artery. There is, however, one inconvenience from the use of iron and cotton in this way, to which it may be well to allude, viz., the difficulty in removing the mass when it becomes necessary to do so. The blood is very solidly coagulated, and with the cotton forms a black mass more like a cannon-ball than anything else, which requires to be gouged out piecemeal. It so completely impacts the vagina that the discharge of urine is prevented by the pressure on the neck of bladder, and it becomes necessary the second day to remove the anterior portion of the mass so as to allow the introduction of a catheter. The day after the whole mass of blood and cotton may be removed except the dressing in contact with the wound, which should be allowed to remain till loosened by suppuration. Great comfort, too, is afforded by syringing out the vagina freely twice a day with tepid water, to which is added a little carbolic acid or solution of chlorinated soda.

I will mention an additional point of interest in each of the above cases. In the first case, that of Mrs. H., symptoms of *tetanus* appeared on the thirteenth day after the operation, affecting the jaws and spine very decidedly, but the extremities little or none. The case was a mild one, but the symptoms did not disappear entirely under about four weeks. Morphia hypodermically soothed her and procured some five or six hours of good sleep out of the twenty-four, and was continued in half grain doses not more than once or twice daily. This is the only case of tetanus connected with operations on the uterus that has fallen under my observation.

The other case to which I have alluded I published as a typical one of dysmenorrhœa and sterility dependent on mechanical obstruction from flexion. In that case not only was the dysmenorrhœa relieved and general health restored, but a letter received from her husband two days ago informs me that she is four months advanced in pregnancy. (See the number of this Journal for July, 1867.)

ART. VIII.—*Report of Three Cases of Gunshot Wound in which the Balls lodged in the Vertebral Canal, two Patients still Living; with Remarks on Division of the Spinal Cord without Immediate Death.* By PAUL F. EVE, M.D., Prof. of Surgery in Med. Depart. Univ. Nashville. (Read before the Tennessee Medical Society, April, 1868, and ordered to be published.)

A FEW months ago our worthy President notified me, that as every one selected to write an essay on "Injuries of the Spine" had declined, he hoped I would consent to do so. In reply it was stated that my library of thirty-six years' collection having been lost during the war, I had not the materials for the work. Apprehending, however, that there might be no paper presented on this interesting subject, the following cases with remarks have been prepared for presentation on this occasion.

CASE I. *Pistol-ball lodged in the spinal column; Paraplegia; Death in sixteen hours.*—F. W., of Morgan's cavalry, was shot by a six inch Der-ringer pistol about 10 P. M., October, 1863, in the Trout House, Atlanta, Georgia. He was seen by several surgeons that night, before being taken at 2 A. M. to the Gate City Hospital, then under my charge, and where he died at 2 P. M. the same day, making a period of sixteen hours after the reception of the wound. When first seen by me, some forty minutes from the occurrence, there were great prostration from shock, though the patient was drinking at the time; a small round opening an inch to the left of nipple, and a little below its horizontal level; its circumference blackened by burnt powder; dyspnœa; no cough or hæmoptysis, but free hæmatemesis; and partial paralysis of the inferior extremities. His sufferings soon became intense, manifested by continual restlessness and constant spasmodic startlings of the pelvis, thighs, and legs, which were best relieved by the inhalation of chloroform. The bladder being paralyzed, the urine had to be drawn off by a catheter. He took the unfavourable prognosis of his case quite calmly; referred with feeling to his family; and spoke of his recent raid into Kentucky. He sank evidently from exhaustion of both nervous and vascular systems, as his wounded stomach would tolerate little else than cold water in small quantities.

By careful *post-mortem* examination, we ascertained that the ball had fractured the left fifth rib about its middle; passing downwards and inwards, it traversed the left chest, perforated the lower portion of the upper lobe of the left lung, pericardium, cut the apex of the heart, then through the diaphragm and central portion of the stomach, and was found lodged in the body of the ninth or tenth dorsal vertebra, a portion of it projecting into the vertebral canal. We were surprised to find so little blood in the pleural cavity, and attempted to account for it from the facts that the ball was small in size compared to the *minié*, and had perforated the lung quite near its fissure into two lobes.

A notice of this interesting case was forwarded to Richmond soon after its occurrence, but I think never published. To make this report as accurate as possible, my efficient assistants in the hospital at the time of the casualty, viz., Dr. R. C. Thomas, now of Bowling Green, Ky., and Dr.

W. M. Wright, of Huntingdon, Tennessee, have each been recently consulted in regard to the above particulars. I can but regret not having secured the specimen and added it to my collection.

CASE II. Large pistol-ball lodged in the spine, followed by partial paralysis; Pirogoff's operation, then amputation of the leg; patient now in good health.—This also is a case of much interest, and its history extends through several years. I was first consulted by this patient in Atlanta, 1862, a short time after the retreat from Fishing Creek, but it was not until my return to Nashville, June, 1865, that the amputation of the foot was performed.

A. G. E., an enlisted soldier of General Forrest's cavalry, who served through several of his wonderful campaigns. Early in April, 1859, during a street encounter in Texas, he was severely wounded in the spine. He states that Captain T. came into town the 23d of April of that year, when a fight ensued, each being armed with Colt's dragoon six shooters of the old pattern, at a distance of about twelve paces, which resulted in the death of Captain T. and the maiming of my patient for life. One ball struck the latter's left temple, injuring the left eye and external ear; a second passed through the left thigh just above the knee-joint; and a third entered near the lower rib of the right side, ranging inwards towards the spine. He instantly fell upon the ground. In falling his pistol was involuntarily discharged, as he was in the act of firing it at that moment. Feeling no pain whatever, only a slight dizziness for a few seconds, he attempted to rise, but found he had no control of his legs. In a few more seconds, he picked up his pistol, found his hand perfectly steady, and at this final shot killed his antagonist. Each had fired six times, emptying their pistols.

At this time my patient was 24 years of age, weighed 140 pounds, was nearly six feet high, and in full vigorous health. He possessed great powers of endurance, and was noted while in the army for his resistance to the effects of hunger, fatigue, and with the exception of his right lower extremity, to cold or exposure of any kind.

The wound, which certainly involved the spinal cord, produced the following symptoms: The instant the ball penetrated the body, he experienced the sensation of numerous rays of heat apparently radiating from the spine, causing no definite pain, but quite a disagreeable sensation. He was taken up, carried into a store, laid on a counter, and as his pulse was feeble, whiskey given him with much benefit. His breathing became rapid and difficult. The wound was now probed, and the cavity of the abdomen found to have been penetrated. Consciousness was unimpaired, and he conversed freely with his friends. At 5 P. M., three hours after being wounded, he vomited his dinner; his extremities then became cold, and it was thought he was sinking. Brandy was now freely administered; heated rocks and hot water were applied, when reaction took place. The patient complained that his right foot was burning, and its sole was found blistered. He now became better, breathed easier, and believes to this day, that the hot rocks to his feet saved his life. At midnight, a catheter drew off bloody urine. He slept some during the night, and in the morning it was observed that his skin had become of a deep yellow colour, which continued two weeks. These symptoms certainly indicated disturbance in the functions of the kidneys and liver, if not lesion in the texture of these organs. He took at 4 P. M. a dose of castor oil, with a few drops of spirits of turpentine, which acted at 3 next morning, and on

the 24th he was decidedly better. He suffered no pain until about the first of May, when he was annoyed by distress in the region of the kidneys for six hours. Up to this date the use of catheters was necessitated, but he now commenced to urinate naturally; there was still little sensibility in the inferior extremities, and none in the right foot. He thinks it was about the 20th of this month he first experienced spasms in the right lower extremity, which continued at irregular intervals to the time of the removal of the foot by amputation. These twitches continued to harass him, sometimes for two hours, and were controlled by opiates and alcoholic stimulants. By the 10th of June, he commenced to walk around the bed, then with crutches, swinging the right foot by a suspensory from the shoulder. His general health now improved, the attacks simulating neuralgia in the thigh, leg, and most frequently in the foot of the right side, became less frequent and less severe. He was able in 1860 to raise the knee of that side, though the foot still hung downwards. He suffered chiefly from cold, and during the winter, while on a visit to Tennessee, it was frost-bitten, and an ulcer formed on the sole of it which was very difficult to heal.

In the spring of 1861, when Texas seceded, he volunteered in a cavalry company, hoping that an active soldier's life would prove beneficial, and so it did; until the disaster, and exposure to cold after the defeat at Fishing Creek. He was now transported to Atlanta, where I prescribed balsam of copaiva for his frost-bitten, half paralyzed right foot. He subsequently joined his regiment near Corinth, and continued with it until the winter of 1863-64, which he spent at Lauderdale Springs, Mississippi, as purveyor to a hospital. The spring of 1864 found him again in the saddle riding to Paducah, then at the capture of Fort Pillow and Memphis, at which latter place he was slightly wounded in his lame foot, and rendered unfit for duty ever since. The ulceration in the sole of the foot now extended, reaching the dorsum and ankle, and never healed. The deep structures became involved, the ulcers enlarged, the pain at times was very great, the discharge profuse, the toes pointing downwards, hanging useless and tripping at almost every step.

In consultation now held, it was decided to remove this useless, disorganized, and painful appendage to the leg. Pirogoff's amputation was performed August, 1865. The result he reported in these words: "The advantages derived from it no one can see as I do; none can know the sufferings endured, or the sense of relief I now enjoy."

This condition continued for some months, without the stump ever becoming perfectly sound. His irregular pains in this leg then recurring, he had the limb amputated about its middle, in November, 1866. Mr. E. is now a night watchman in one of our banks, and in good health except occasional recurrences of irregular nervous movements in the remaining portion of his right lower extremity. This account of his case, he pronounces correct.

CASE III. Ball in the dorsal vertebral cavity; Paraplegia; Trepanning without benefit.—In July, 1866, Mr. H. was brought from Kentucky to consult me for a wound he had received during the war. In General Wilson's raid through Alabama, in the winter of 1864-65, his regiment was charged, defeated, and pursued. Refusing to surrender, and being closely followed by the Federal cavalry, while holding the bridle in the left hand, the right being armed with a pistol, in the act of turning his body

to the left side to fire back, he was himself shot, falling instantly into a mud-puddle, his horse passing from under him. The pistol-ball entered to the left of the spinal column, about an inch from the spinous process of the sixth dorsal vertebra, in the cavity of which, or that of the seventh, it is supposed to be lodged. He immediately became paralyzed, except his arms and neck, and was taken to a house near by to die, as was supposed by two or three Federal surgeons, who, be it said to their honor, and that of our humane profession, treated him as kindly as they did their own wounded men.

During 1865, he managed to reach home in southern Kentucky, and would there, seated in a small chair, aided by his hands in slipping it from side to side, wander into the woods to spend the day alone, for, poor fellow, it is said he found little sympathy in his own family.

In consultation with several friends, members of our city Society as well as this one, it was determined to make an attempt to remove the ball, still compressing the spinal marrow, as the patient was to this time so paralytic that he was accompanied by a friend to wait upon him. He had even now no control of his left inferior extremity, and the right, which he moved a little, or when aided in doing so by others, would frequently take on violent contractions, tonic and clonic spasms, and become forcibly flexed on the buttocks. He had only imperfect sensibility in either of them. He could urinate but with difficulty, and the bowels acted only from drastic purgatives. Half a grain of the extract of *nux vomica*, with a grain of the extract of rhubarb and half a drop of croton oil, proved to be a good combination in his case.

After due preparation, a free incision was made through the cicatrix and an attempt made to follow this into the vertebral cavity; but so deep was the vertebral groove down to the transverse processes, so indistinct the track of this missile, indeed, we could not trace it; so deceptive the intervertebral foramina, &c.; but above all, so great the dread of exciting inflammation by wounding the sheath of the spinal cord, that we concluded, after using one crown of the trephine, of medium size, over what all believed to be the hole made by the bullet, to desist from further application of it. I am satisfied that this operation in the dorsal vertebræ, if not almost impracticable, is certainly one of the most difficult in surgery. It vividly recalls the case mentioned by the late Mr. Guthrie, in his *Commentaries on the Surgery of the Peninsular War*, of a patient who had received a pistol shot in the last dorsal or upper lumbar vertebra, who had searched London and Paris, in vain, for a surgeon willing to operate on him.

Velpéau states that Cline first, then Tyrrell, each tried to remove either splinters of bone, or blood compressing the cord, but their patients died in a short time after; and adds, "I can scarcely believe that a surgeon can meet with indications sufficiently precise to justify the repetition of these attempts with any expectation of success." We have the authority of Surgeon Thomas Longmore, of the British army, for the fact, that the late distinguished military surgeon of France, J. B. L. Baudens, extracted a ball lodged in the eleventh dorsal vertebra, which had caused compression and complete paraplegia. The paralysis at once ceased, but unfortunately tetanus supervened, and speedily proved fatal. In the *New York Journal of Medicine* for 1854, vol. iv., is the account of a very extensive operation on the vertebræ, performed by Dr. H. A. Potter, then of New York State, but who moved soon after to Michigan. The patient was severely wounded

by the limb of a tree falling sixty feet and striking him on the cervico-dorsal region, producing symptoms of compression on the medulla spinalis, so that, for three months, he could not move a finger or a toe, or tell when he was handled. Dr. P. made an incision from the second cervical to the third dorsal, and removed parts of the four inferior and two superior dorsal vertebræ. The patient was evidently improved by this operation, and his life prolonged from it, but died eighteen days after it from apparent suppuration from the lungs.

It may be that operative procedure for persisting compression of the spinal cord may hereafter be wisely limited to the removal, or attempt to remove, foreign bodies producing the pressure. Surgeon Alexander Shaw, the author, in *Holmes' Surgery*, of the article on Injuries to the Back, is decidedly opposed to all operative interference in these cases.

The incision, in my case, was about eight inches in length; its edges could, with difficulty, be retained in apposition, and required time to heal by granulation. Of course he derived no benefit from his visit to Nashville, and is now as he was when he came to me. My last intelligence from him is to the 30th of March, only a week ago, and from his family physician, Dr. J. P. McClendon.

It will be observed that this report embraces only *injuries of the spine* produced by gunshot wounds. Those arising from other sources are omitted to prevent prolixity, hence no allusion in this paper has been made to the recently suggested treatment of spinal irritation by bromide of potassium, or the valuable relief in chronic cases obtained by the use of India-rubber water beds.

Remarks on the question, Does a Division of the Spinal Cord necessarily induce Death?—We find in vol. ii. of the *Medical and Surgical History of the British Army*, which served in the Crimea and Turkey during the war against Russia, in 1854–55–56, presented to Parliament, under the head of gunshot wounds of the back and spine, with fracture of the vertebræ, and with lesion of the spinal cord, a total of 22 cases of officers and privates thus injured, every one of which proved fatal.

In Circular No. 6, War Department, Surgeon General's Office, U. S. Army, issued November, 1865, of 187 cases of gunshot fractures of the vertebræ, all died but seven. In six of these it is supposed that either the spinous or transverse processes only were involved, and in the seventh case, wounded on September 20th, 1863, at Chickamauga, Ga., the ball drove in the spinous process of the fourth lumbar vertebra, and lodged in the vertebral canal. The patient was brought to this city (Nashville) where the missile, with fragments of bone, was extracted. He was subsequently sent to Louisville; then to Jefferson Barracks, Missouri; thence to Indiana; and finally to Quincy, Illinois. When last heard from, he was reported to be recovering. I propose to add another case, making two of this nature, which occurred in the Federal service.

In the Army Medical Museum of the United States, located in Washington City, are 66 specimens of fatal vertebral gunshot wounds. In the catalogue there are 75 cases reported fatal, some of them beautifully illustrated in a volume of over 1000 pages. In one, occurring June 3d, 1864,

a conical ball shattered the transverse and articular processes of the eighth and ninth dorsal vertebræ. The patient immediately lost all sensation and motion below the wound. After lingering for sixteen days, gastritis supervened and he died on the 2d of July. The autopsy revealed the *spinal cord completely severed* at the seat of injury, and it was also found to be disorganized below and above it. The possibility of a patient surviving the complete division of the spinal marrow, has never, to our recollection, been discussed, and yet it is of interest to the profession. The opinion prevails that a "broken back man" must die, though this ultimate result will depend much upon the position of the wound in relation to the regions of the spine. The most fatal point of the cerebro-spinal axis is unquestionably the medulla oblongata, the conjunction of the brain and spinal cord. Its central vesicular neurine presides over respiration and deglutition, and is therefore properly considered the *centrum vitale*. The act of pithing by thrusting an awl between the occiput and atlas, kills an animal outright; so, too, will hanging destroy life instantly, when the odontoid process of the second vertebra is dislocated. Now, experience has taught us that lesions, either of the brain or spinal marrow, are fatal just in proportion as they approach the medulla oblongata. In the museum of the Middlesex Hospital is the specimen of an axis with a pistol ball imbedded in the base of the odontoid process. The man was shot from behind, horizontally, between the arches of the atlas and axis. His mistress, awake at the time of the shooting, dwelt upon the fact that the loud report of the pistol did not startle him, and says he never moved a limb, in other words was instantly killed.

A wound or compression to the cord in the cervical vertebræ is more mortal than in the dorsal, and this again more serious than in the lumbar region. When the latter is injured, the paraplegia is partial, and if near the *cauda equina*, the patient may linger for months, and even years; but if in the dorsal, few survive beyond three or four weeks; while in the cervical, if above the third vertebra, death is inevitable and sudden; and below this point, there is paralysis of all the limbs, and death is apt to occur in a few days or weeks at most. And as it is by these varying symptoms developed in a case after injury to the spine, that its diagnosis and prognosis are ascertained, and the best treatment to be pursued, the importance of the proposed question may well be inferred: Can life be preserved when the cord is divided?

The great English military surgeon of the close of the last and the first quarter of the present century, John Hennen, published the account of a sergeant in the Enniskillen Dragoons, who was struck at Waterloo by a piece of a Polish lance, which stuck fast between the spinous processes of the two last dorsal vertebræ. The patient was completely paralyzed until this was removed. He refers also to the case of Dr. Boutel, in the *Parisian Chirurgical Journal*, of a gunshot wound which com-

pletely divided the medulla spinalis at the tenth dorsal vertebra, after which the man lived twenty-six hours, could urinate but not defecate, and who, moreover, as in my own case at Atlanta, was affected with constant agitative movements of the pelvis and lower extremities.

Sir Astley Cooper, in his work on fractures and dislocations, says that the symptoms and results of injuries to the spinal cord differ relatively to the situation of the wound, whether this be above or below the third cervical vertebra, or origin of the phrenic nerve. He mentions a case in which the medulla spinalis was almost entirely divided; another wherein it was, for a considerable distance, completely softened, so that there was nothing remaining but the *empty sheath* in the canal; and he farther declares that when the patient survives this injury, viz., division of the cord, for some time, bulbs are organized at each end of it.

In September, 1849, surgeon Hutin, of the French army, presented to the Academy of Sciences, in Paris, a pathological preparation taken from a soldier dying of Bright's disease, who, in 1835, in Algeria, was struck by a ball in the right lateral surface of the spinous processes of the first two lumbar vertebrae. Paraplegia was the immediate result, and the wound, after suppurating three months, healed without the removal of the foreign body. The specimen exhibits the ball firmly implanted in the vertebral canal for the last fourteen years, and by it the right half of the end of the spinal cord, or rather commencement of the *cauda equina*, had been divided, the left half displaced by it, and the medullary substance much disorganized.

In the *American Journal of Medical Sciences*, vol. xxv., 1853, Dr. Parkman, of Boston, is said to have presented to the society for medical improvement of that city, an extensive fracture of the spinal column, with *complete division of the cord*, the patient surviving two months. The injury sustained in this case was a fracture through the body of the fifth dorsal vertebra, and the bodies of the third and fourth being separated from their laminae, were pushed in front of the sixth and seventh. The *division of the cord was complete, yet the patient lived two months.*

We next give a synopsis of a case reported by Dr. Eli Hurd, in the *New York Journal of Medicine* for 1845. Its title is—

"Division of the spinal marrow; recovery of patient five years afterwards."
—In jumping from a wagon his feet slipped from under and he fell on his back. In attempting to rise he found his lower extremities paralyzed. Calling for assistance he stated that a chisel was sticking in his back, which he recollected was in his coat-tail pocket. It measured five inches in length to the shoulders, seven-eighths of an inch in width, and from a quarter of an inch at the shoulder, tapered to one-eighth of an inch in thickness at the cutting extremity. It required the united effort of several men to extricate this foreign body; and during the operation the patient suffered very little, but said he saw apparently vivid flashes of light, which were followed by total darkness. The wound was opposite the spinous process of the lower dorsal vertebrae. Total insensibility of the surface below it, with paralysis of the inferior extremities, bladder, and rectum, were the immediate consequences. He was prostrated for forty hours, and then reaction was followed by fever for several days. The wound healed

rapidly, the urine was drawn off by a catheter for eight days, and cathartics failed to move his bowels until aided by enemata. Sensibility returned in the skin on the fifth day, and imperfect use of the limbs about the fifteenth. Four years and seven months after the injury, so defective was sensation over the left knee, that without being conscious of it, he was so severely burnt that months were required to heal it. The reporter of this case entertains no doubt whatever but that the *spinal marrow was completely divided and afterwards united*. He thinks the cord may be considered no more than a bundle of nerves contained within a common sheath, and, like a nerve, might reunite after division as in tic douloureux.

A very curious case resulting from an extensive injury to the head and spine occurred to a young man in Virginia, 1845, who while cutting down a tree was struck by a large falling limb. Besides laying bare the occipital bone, and contusing his shoulders, there was also a supposed dislocation of the fifth and sixth cervical vertebræ, followed by total paralysis of all that portion of the body below the point injured. He had perfect paraplegia. A thread would define the sensitive parts from those not so, thus evident was the line of demarcation. The vital functions, respiration, secretion, assimilation, were normal, but the nerves of motion and sensation below the seat of injury never in the slightest degree resumed their offices. His mental vigour became unusually developed. He dragged himself, lying on his back in his little carriage, to places of excitement: the circus, parades, etc., were what he most enjoyed. In 1851, six years after date of the injury, he presented himself before the Greene County Medical Society, New York, and requested that his lower limbs should be amputated, as they were useless appendages to him, and retarded his roving peddling propensities. He said they took up too much room in his travelling vehicle. Being advised against the operation there, he sought advice elsewhere, and had both thighs amputated close to the hip-joint, *without the slightest pain or tremor of a muscle*. The stumps healed almost by the first intention, and the patient resumed his former course of bacchanalian life. He died suddenly in May, 1852. Singular as it may be, there was no doubt that the energy of this man was increased and his character changed by the spinal injury. (See *N. Y. Journ. of Med.*, 1853.)

Dr. Gross, in his *System of Surgery*, states that Dr. W. W. Keen furnished him a case proving how much injury the spine may sustain without fatal consequences.

A soldier was wounded at Gettysburg, July, 1863, and is the second instance already alluded to, in which death did not ensue in the U. S. Army, after the *medulla spinalis* was implicated by a gunshot wound; and we are surprised to find it has escaped the notice of the Surgeon General. A soldier was struck by a ball on the upper lip, which was found lodged in the body of the third cervical vertebra. *Sixteen fragments of bone* were removed at intervals, including the anterior half of the vertebral foramen, yet no hemorrhage followed. Paralysis of the extremities occurred, but subsided soon after the ball was removed, and the patient so fully recovered and without deformity, that he actually re-entered the service. This is certainly a most remarkable case.

The same author refers to another instance, the particulars of which he had obtained, but did not see the case, in which a ball passed between the fourth and fifth ribs, *cut the spinal cord in two*, except a mere thread, and lodged in the body of the seventh dorsal vertebra. Immediate loss of

motion and sensation ensued, and the patient, a man aged 30, died on the eighth day. He also gives an account of a case he attended with Dr. Thompson in Louisville, Kentucky, 1854, wherein a patient, intoxicated, aged 29, was wounded by a pistol shot, and after death, which transpired in three days and a half, the ball was found lying loose in the vertebral canal, between the last cervical and first dorsal vertebræ, and had disorganized (penetrating and pulpifying are the words used) the cord, and *cutting it in two* by projecting across it a fragment of bone. When shot, this patient fell as if struck upon the head, and for a moment it was thought life had fled. After reaction took place, he was found to be paralyzed from near the top of the sternum to the soles of his feet; the pulse was feeble and slow, respiration laborious, bowels torpid, and the bladder had to be relieved by a catheter, yet *he lived over three days*.

I recollect well the case of Captain Searle, of the U. S. Army, who was shot by the Indians during the last Seminole campaign in Florida. This occurred on November 25th, 1839, while that officer was seated in a common baggage wagon, through one side of which the ball passed, entered on the line of the last dorsal with the first lumbar vertebra on the right side, and where lodged was never ascertained. The immediate symptoms were loss of motion and sensation in the lower extremities, bladder and rectum paralyzed, and no feeling in the skin below Poupart's ligament. The catheter, castor oil, and enemata were resorted to, for about two years. In 1841, he found that the bladder would act by *tickling the side of the penis, behind the corona glandis*, and afterwards this would also induce the rectum to discharge its contents. This manipulation, however, did not communicate with the sensorium. The captain was still alive in Rhode Island, when I left Augusta, Georgia, in 1852, since which time I have lost sight of the case, but have an indistinct recollection of having heard that he had died.

Mr. Page, of Carlisle, England, attended a patient a few years ago, who was also seen by Mr. Syme and Dr. Duncan, of Edinburgh, who received an injury by a fall from a high terrace. From that moment complete paralysis of every part of the body followed, except of the head and the power to rotate it. He lived nearly fifteen months. An examination, after death, exposed a fractured cervical vertebra, either the fourth or fifth, with such displacement that the cord was nearly divided, it being reduced in size to less than a crow-quill for about three-eighths of an inch, and above and below it was a softened pulp. It is added, by the reporter of the case, that "there could be no doubt but that the *severance of the cord*, and the damage in the immediate neighbourhood of that point, were inflicted at the moment of the accident."

To Mr. Alexander Shaw, already referred to, we are indebted for our last case now given, which he says came under his care May, 1849, in Middlesex Hospital, London. The patient fell from a window, and was taken up in an insensible condition, recovering consciousness the next day. He was told he had fractured his spine. The pain in his back corresponded to an irregular projection over the fifth and sixth dorsal vertebræ. He was hemiplegic, and catheters were used for months, when he had so improved that he voided his urine naturally, and began to walk a little. He had now an interval of seven years, during which he enjoyed health, and led an active life. He then had a relapse, attributed to taking cold from riding on a diligence in France, but recovering from this, he followed again his usual pursuits for five years more. Thirteen years after the

injury, he began to drag his legs, which felt unusually heavy to him. He now became paraplegic again, entered the hospital, and died at the end of twenty-two years after his fall. In the vertebral canal was found an apparent collapse or *vacuity in the place of the cord*. *For two inches the substance of the cord had disappeared*, and there was a confused structure of the arachnoid and pia mater, the dura mater having undergone a less destructive change. Each end was soft and diffuent, and it was difficult to decide whether there was any nervous substance intervening between these, nothing being recognized as the remains of the spinal marrow; and yet, notwithstanding this pathological condition of it for inches, this man, a shoemaker, had pursued his trade and travelled extensively for nearly a quarter of a century.

In the review now of these cases here collected in a week or two, we have three in which the medulla spinalis was nearly divided, in one probably it was so divided, this patient having recovered, and in seven the division was known to have been complete. The authorities for these cases are Sir Astley Cooper; Surgeon Hutin, of the French army in Algiers, whose patient lived fourteen years; and Prof. Gross, in whose case all the cord was cut save a mere thread, death occurring in eight days. Dr. Eli Hurd reports the case of supposed division and reunion of the cord. The seven cases of its complete severance, without extinction of life, are:

1st. United States soldier, lived a month, see catalogue, Army Medical Museum, War Department.

2d. Surgeon Boutel, soldier in the French army, lived twenty-six days.

3d. Sir Astley Cooper.

4th. Dr. Parkman, of Boston, lived two months.

5th. Prof. Gross, lived three-and-a-half days.

6th. Surgeon Page, Carlisle, England, lived fifteen months.

7th. Surgeon Alexander Shaw, Middlesex Hospital, London, lived twenty-two years.

The conclusion, therefore, is indisputable, that death does not necessarily follow a division of the spinal cord.

ART. IX.—*Four Cases of Aneurism treated by Ligation.* By ROBERT REYBURN, M. D., Associate Professor of Anatomy and Professor of Clinical Surgery, Med. Dep. Georgetown College, D. C.

THE following cases of aneurism have been treated at the Freedmen's Hospital, Washington, D. C., during the past sixteen months, and are deemed sufficiently interesting to be placed on record:—

CASE I. *Aneurism of right primitive carotid.*—George W., aged 25, admitted Dec. 2, 1866, with hemiplegia of left side, the result, he states,

of blows on the head, received in a drunken brawl a few days previous; no cut or bruise or depression, however, could be discovered on any part of the head. The mouth was drawn to the right side, and the tongue protruded to the left; partial ptosis of right eyelid, and total blindness of the right eye (not aware of it until to-day, July 9). Improved slowly but steadily, and in a little more than two months was able to walk about the ward and hospital grounds. No improvement in the affected arm for a considerable time afterwards, but can now raise his left hand to his face.

The aneurism was first noticed about the middle of April, and, on being questioned, he says that he felt the pulsation and became aware of it the first week in March. It increased in size rapidly, interfering materially with deglutition, and pushing the larynx nearly an inch to the left of the median line; the pressure of the tumour also gave rise to a loud stridulous cough, which annoyed him almost constantly. During the two weeks preceding the operation he complained of pain in the tumour, at times very severe, headache, and loss of appetite, and was obliged to keep his bed. Pulse 120.

At 6 P. M., May 22, 1867, I applied a ligature to the right common carotid, just below the omohyoid; loss of blood trifling, not exceeding two or three drachms; the edges of the incision retained in apposition by adhesive straps; no sutures or compress applied.

May 23, 8 A. M. Pulse 128; breathing slightly stertorous; inclined to sleep; pain in the tumour not very great; no headache; cough continues, but not much expectoration; slept well during the night. 8 A. M. Pulse 110; no change otherwise; deglutition painful, the same as before the operation; respirations 20.

June 2. Pulse 114; feels perfectly well; tumour apparently softer, and lessened somewhat in size.

3d. Pulse 116; respirations 20; ligature came away this morning; no hemorrhage; improving steadily.

6th. Pulse 100; improving every day; able to walk about the ward and grounds.

9th. The tumour is diminishing slowly in size, and is softer; no pain or uneasiness in swallowing; cough continues, but is not so severe; the larynx is not so far to the left of median line as before the operation; and, so far as the operation is concerned, the man is well.

July 10. No record was kept after above date; a slight discharge continues; the tumour is still somewhat prominent, but is much smaller than at the time of the operation, and softer. The larynx is slightly to the left of the median line, but the displacement is not marked.

March 18, 1868. Examined this patient to-day, and found that the aneurismal tumour had been entirely absorbed, and that he has so far recovered from his paralysis as to resume work.

CASE II. *Femoral aneurism.*—Hilley J., aged 30, admitted to hospital April 15, 1867, with aneurism of left femoral at inferior third; tumour at base about four inches in diameter; result of gunshot wound received three years ago; the bullet had never been removed, and could be felt upon the anterior surface of the tumour.

May 8. Digital pressure was applied to the femoral artery for about two weeks, but failed, probably through want of skill on the part of the attendants, although the pulsation in the tumour was sensibly weakened. The ligature was applied about two inches below the profunda, and the incision

closed by adhesive straps. no sutures being applied; no diminution of temperature in leg or foot; very slight numbness on the outside of the knee; no unfavourable symptoms of any kind, more than would follow a simple incision of the same extent. On the tenth day slight hemorrhage occurred, and on the three or four following days, sufficient only to discolour the discharge; a little thickening and soreness in the line of the femoral. On the nineteenth day the ligature was removed. At the end of the fourth week the patient left the ward, able to walk with the assistance of a cane.

June 12. Discharged at his own request, quite well; tumour considerably diminished in bulk, but still quite prominent.

CASE III. *Popliteal aneurism*.—John C., labourer, aged 35, admitted to hospital Oct. 9, 1867, with popliteal aneurism of right leg; had existed about one year. The tumour diminished in size during the first week after admission, but still hard and tense; is most prominent at a point opposite the bifurcation of the popliteal artery; pulsation evident, but not very strong; a blowing sound present, but not well marked—requires to be listened for carefully; the whole calf of the leg appears to be enlarged and hard; sensation in the foot is impaired, especially along the outer side, and complains of almost constant pain in the tumour and also in the foot, the pain in the latter being referred to the ball of the foot, and occasionally to the heel.

Oct. 23. I applied a ligature to the femoral in its lower third at 4 P. M.; very little difficulty experienced in the operation, the vessel being found almost immediately; not above two ounces of blood lost.

24th. Pulse 96; feels quite comfortable; warmth of leg and foot normal; he thinks the pain is not so great as before the operation; complains of some pain in the knee-joint, inner side; numbness of the foot about the same. Ordered a light nutritious diet.

31st. Pulse 96; less pain than usual; edge of incision agglutinated together; not a drop of pus has made its appearance so far.

Nov. 1. Pulse 100; feels better in every respect; appetite good; less pain; sensation in foot is improving; no suppuration yet; applied a tourniquet loosely to the femoral, as a matter of precaution.

2d. Pulse 100; the incision apparently united in its whole extent; after some manipulation, some three drops of pus escaped at the point where the ligature emerges.

3d. Pulse 100; complains of pain in the wound, extending upward to Poupart's ligament; removed the dressing, when about two ounces of offensive pus escaped; the ligature appears quite firm; sensation in the foot is improving; no other change worthy of note.

4th. Pulse 96; considerable suppuration, mixed with sufficient blood to colour the pus a deep red; some pain.

7th. Feels quite well; there is occasionally some pain in the knee, foot, or leg, but is not so constant as formerly.

10th. Ligature still immovable; slight traction is made upon it every morning; sensation in the foot improves steadily, but the tumour is yet quite firm, and decreases in size very slowly.

15th. No special change since last report; the ligature yet remains; suppuration moderate, and not coloured; for the last week appetite good; appears to be perfectly well; slight changes occur from day to day; pain complained of frequently, generally referred to the heel or ball of the foot.

23d. Ligature came away this morning; no hemorrhage; slight thickening or hardness can be felt in the line of the incision; tumour still large, but not so hard.

28th. Hemorrhage from the wound occurred suddenly last night about one o'clock, to the extent of one pint, the patient thinks, but probably it did not exceed six or possibly eight ounces. The tourniquet was tightened, a compress and bandage applied, and the hemorrhage ceased. This morning, directed the limb to be well raised, the shoulders lowered, and the tourniquet to be left perfectly loose, so as to interfere as little as possible with the return of the blood through the superficial vessels.

29th. No return of the hemorrhage, and appears none the worse for the loss of blood.

30th. No change; suppuration moderate in quantity; is required to keep perfectly quiet.

Dec. 10. No record has been kept since Nov. 30; the patient is improving rapidly; is now allowed to sit up; the discharge is slight, and the incision nearly healed over; sensation in the foot is almost as perfect as in the other, but numbness about the ball of the great toe is still complained of. The tumour has changed very much during the last ten days; it is now quite soft, and very much diminished in size. The change is more apparent when the leg is partly flexed upon the thigh.

15th. Continues to improve; is anxious to be allowed to go home; suppuration from the wound is barely sufficient to stain the cloth applied to it; pain in the tumour and in the heel recurs, but it is slight and usually of short continuance; sensation is not yet entirely restored in the ball of the great toe, but it is probable the patient would scarcely notice the feeling of numbness if his attention were not called to it, or had he anything else to occupy his mind.

17th. No special change since last report; experiences some difficulty in walking, for the reason that during the past year the leg has been kept almost constantly in a semi-flexed position, the flexors are consequently a little contracted.

19th. Discharged cured.

CASE IV. *Femoral aneurism*.—Charles W., aged about 50, admitted to hospital from station-house, Jan. 10th, 1868. Is insane, talkative, and troublesome, but not violent; has an aneurism of right femoral artery, upper third; the tumour is about four inches below Poupart's ligament, and nearly the size of a closed fist. The whole limb is cedematous, the cedema extending up to and even beyond the tumour, which is itself cedematous; the pulsation is strong, the blowing sound well marked and somewhat harsh in character. He says he received a kick in the groin about two months before admission, and that the tumour made its appearance immediately afterwards; no reliance, however, can be placed on his statements. Considering the unfavourable character of the case, the location of the aneurism, and the insanity of the patient, it was resolved to try digital pressure, which was continued for one week, beginning January 15th, but with no result. It was next to impossible to induce him to submit to such a degree of pressure as would suffice to cut off the current of blood from the tumour.

On the 18th, a small abrasion of the cuticle was observed on the most prominent part of the tumour, and in the course of the next three days a small ulcer formed, about the size of a nickel cent, from which oozed a few

drops of bloody fluid, and, by the 22d, the quantity increased sufficiently to soil three or four inches (square) of the bed clothing, and some fears were entertained that the tumour would give away.

On the 22d (in order that the patient should have every chance before an operation was resorted to), he was placed under the influence of ether, and a tourniquet applied, as near Poupart's ligament as convenient—thus cutting off the circulation effectually; with the expectation that coagulation would take place in the tumour. Pressure was steadily maintained for two hours and a half, both above and below the aneurism, but as soon as the tourniquet was loosened pulsation returned, apparently undiminished in the least. It was evident that an operation had become absolutely necessary to save the man's life, as, judging from appearances, the tumour might give away at almost any moment.

On the 23d, I ligated the femoral artery about two inches below Poupart's ligament, in presence of Drs. Eliot, Lieberman, Bond, and students. Upon applying the ligature, the vessel gave way and the blood welled up, filling the wound faster than it could be sponged out, and for a moment it seemed that the patient might possibly die under our hands; firm pressure with the finger upon the artery, at the point where it emerges from beneath Poupart's ligament, checked it for a few moments, until it was effectually stopped by one of the students pressing upon the abdominal aorta, about the point of bifurcation, and a little to the left of the median line; hardly a drop of blood was lost afterwards. A ligature was then applied close to the ligament, where the vessel appeared healthy, and another one to the diseased portion, as close to the tumour as the extent of the incision would permit. Although the hemorrhage was quite profuse for a few seconds, the quantity of blood lost could not have been very great, as the pulse was not affected by it.

January 24, 1868, 9 A. M. Pulse 100; passed a quiet night; he has been much quieter since ether has been administered on the 22d; cannot detect any difference in the temperature of the two limbs, although immediately after the ligature was applied to the artery, it was thought that the leg was warmer than the sound one. Bowels moved in bed this A. M., a common circumstance, I believe, before the operation; light, nutritious diet, beef, etc.; limb wrapped in woollen blankets. Afternoon: Pulse 96; no change, urinates in bed habitually, the dressings are saturated with urine a great part of the time, no desire for food, but drinks beef-tea very freely.

25th. Pulse 96; slept well; more talkative than yesterday; dressed wound; discharge slight; leg and foot warm.

26th. Pulse 88; rested well last night; appetite improving; limb warm, toes cool, but not cold; sensation perfect. The tumour is nearly the same size, but it is softer; the point of threatened rupture has scabbed over or dried up. Suppuration slight, but the wound is somewhat irritated by the urine; extra precautions have been taken to keep the parts dry.

27th. Pulse 84, of fair volume; limb warm; the wound is now kept free from urine by keeping the penis hanging in a urinal and emptying it frequently; but the bowels are generally moved in bed, so that great care is required to keep him clean. He is much quieter and more manageable than before the operation, and appears anxious to recover; has less pain in the tumour, and is less restless, probably for that reason; the scab has come off the ulcer, and it is now a little larger, nearly or quite an inch in diameter.

28th. Pulse 92; limb warm; rested well last night; appetite good, feels very well; ulceration larger; discharges bloody matter, and looks as though it may open at any time; great difficulty in keeping him clean and dry.

29th. Pulse 88; suppuration from the wound increased, also from the tumour; the discharge from the latter bloody, no pain; he says that he feels quite well, eats well, and drinks beef-tea abundantly.

30th. Pulse 88; no special change; a small ulcer has made its appearance upon the outer surface of the tumour, about half an inch from the large one; is superficial; nearly all the discharge, blood, etc., comes from the larger one, and its odour is offensive.

31st. Pulse 88; the suppuration is quite free from the incision, but is not coloured; this morning a considerable quantity of bloody matter and coagula escaped from the large ulcer in the tumour, 3iij or more. The ulcer has probably reached its cavity.

February 1. Pulse 80 and feeble; had some hemorrhage last night from the opening in the aneurismal sac, a little from the incision; the amount must have been considerable, but it is impossible to make any estimate of the quantity. The nurses did not send for me when it began, and when about to do so the bleeding ceased. He shows the loss of blood this morning; pulse weak and very restless. 3 P. M. Hemorrhage recurred about half an hour since, checked in a few minutes by the free application of persulphate of iron. As soon as the bleeding ceased, I applied a ligature to the femoral, in the middle third, four or five inches below the tumour; after the operation pulse 80, stronger than this morning. When fairly under the influence of the anæsthetic the pulse became very weak; the sponge was immediately removed, and in a few minutes it improved in volume. 9 P. M. Pulse 80 and fair; is very restless, constantly tossing his arms about; no hemorrhage since last record; strong beef-tea and whiskey punch ordered.

2d. Worse this morning; pulse barely perceptible, very restless, and unable to talk plain; is delirious; slight hemorrhage occurred about 12 o'clock last night, but the nurse stopped it with but little difficulty, by the application of the persulphate; the loss of blood must have been trifling, but he has none to spare; cannot get him to swallow anything. 6 P. M. Pulseless, no hemorrhage, about the same otherwise; evidently dying; cannot induce him to drink anything; if it is put in his mouth he spits it out.

3d. Died at half-past 12 o'clock last night.

Post-mortem examination made fifteen hours after death.—Considerable fluid escaped upon the removal of the calvarium; dura mater adherent at several points along the median line. Right lung adherent at apex, otherwise both lungs unusually healthy. Heart: pericardium firmly adherent at all points; could not be separated without careful dissection; weight of heart $18\frac{1}{2}$ oz. No examination of the chest had been made during life. The tissues around the tumour and incision were infiltrated with pus of a dirty gray colour, and very offensive; found a clot in the artery above the first ligature; none of the ligatures had separated; when hemorrhage occurred the blood must have come from below; found an opening in the femoral artery near where the profunda is given off; this opening was filled with a large coagulum, and a larger mass was found outside.

Remarks.—The case of George W. (No. 1), above reported, was, when considered in either its medical or surgical aspects, one of remarkable interest. This man, on admission into the hospital, was found to be suf-

fering from hemiplegia of the left side, and facial paralysis as before described. He was placed under appropriate treatment for three months, and he slowly but steadily improved. At the end of that time the aneurism of the carotid was first noticed, and as is usually the case, after attaining a certain magnitude, it grew quite rapidly, and at the time of the operation had attained the size of a hen's egg. The interesting point to be decided was, what connection (if any) existed between the aneurism and the hemiplegia; and I am of opinion, after a careful study of the phenomena presented in this case, that the same condition of the primitive carotid which preceded the formation of the aneurism also existed in the other bloodvessels of the body, and was the predisposing cause of the hemiplegia.

Excluding traumatic causes, the most common cause of aneurism is generally admitted to be an atheromatous degeneration of the arterial coats. Now, if we will suppose this to be not a local disease, but one which generally exists in a number of the bloodvessels at the same time, we will have reason to infer that either the excitement, or the blow received, sufficed to rupture the weakened coats of one of the bloodvessels of the brain in this patient, and caused the formation of a clot, which produced the symptoms above mentioned. This view of the case is strengthened by the gradual improvement which took place in the condition of this patient, and which was probably coincident with the gradual absorption of the clot.

In two of the cases above mentioned the pressure treatment (by the old method) was thoroughly tried, but failed to cure. I feel perfectly satisfied, however, that though the pressure failed as a curative measure, yet it was very beneficial in these cases, for the reason that it assisted very materially in establishing the collateral circulation. It will be noticed that the circulation in every case was rapidly and thoroughly established, and there can be no reasonable doubt that this was in a great measure owing to the gradual enlargement of the arterial branches given off above the point at which the main arterial trunk was ligated, during the time that the pressure was being applied.

In the case of the aneurism of the primitive carotid (Case I.), pressure was not applied, as it was obviously impracticable; indeed, the slightest pressure, or even touch, upon the aneurismal tumour, produced violent paroxysms of stridulous coughing, and interfered seriously with respiration and deglutition.

In Case IV. (Charles W.) it will be noticed that the old method of gradual pressure was tried, and, after that had failed, the new method by quick pressure, so successfully used in Europe recently for the rapid cure of aneurism, was resorted to, but without any satisfactory result, and we were compelled to resort to the ligature.

Finally, in reviewing the history of the above cases, it will be observed that they confirm in the strongest manner the teachings of the later

authorities in surgery, and which are to the effect that we should always, when possible, try pressure before resorting to the ligature in the treatment of aneurism.

ART. X.—*Case of Muco-Periosteal Uranoplasty.*

By WM. R. WHITEHEAD, M. D., of New York. (With three wood-cuts.)

I WAS recently induced to undertake a very careful examination of the subject of uranoplasty from the gradually increasing interest which the following case elicited; and which, having been peculiarly instructive, its history may be worth recording.

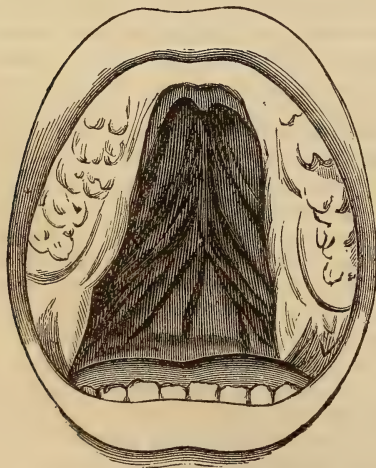
CASE.—At a meeting of the New York Medical Journal Association, I exhibited a patient with cleft palate, as one in which an excellent result had been obtained simply by staphylorrhaphy. Subsequently Langenbeck's operation of muco-periosteal uranoplasty was performed.

Properly speaking, this case was not one of cleft or fissure, but a congenital absence of the palatine vault, with only a rudimentary development of the palatine muscles on each side of the throat. The broad bony chasm, through which were plainly visible the vomer and inferior turbinated bones, extended forward to the gums of the front teeth, and was originally seven-eighths of an inch by measurement in its widest part; but the open space between the atrophied palatine muscles was more than an inch. The patient, a lady, aged about twenty-five years, had worn for several years a metallic obturator which accurately closed the fissure in the hard palate, rendering her efforts at speech and deglutition less painful, but it was evident that so long as there remained a cleft of the velum palati the degree of improvement in speech would be inconsiderable. Desirous, therefore, of uniting by suture, even should it be to a very limited extent, only the cleft of the soft palate, which I considered would increase the usefulness of the obturator, I operated about the first of last July, dexterously assisted by Dr. R. O. Mason, of this city. At that time there was obtained only a partial union of the parts which I attempted to unite, the upper sutures having cut out on the first day; this was due to incomplete division of the levator palati muscle on one side. However, the slight improvement in speech which followed made her desirous to have the operation repeated, and this was done on the eighth of the following month. The palato-glossus and palato-pharyngeus were successively cut on each side as previously, but the precaution was taken to sever low down and very thoroughly the palato-pharyngeus. The levatores palati were divided according to Sédillot's method, using for that purpose sharp and probe-pointed tenotome knives. The sharp-pointed knife being passed immediately to the inner side of the hamular process on each side, through the rudimentary and atrophied velum palati, held tense by a pair of forceps, the levatores palati were cut, as were also the reflected tendons of the tensores palati. Sartin's canulated needle, modified by Tiemann, containing silver wire was used, but at the third suture the instrument got out of order, and Sim's needles and forceps were used.¹

¹ Mr. Tiemann has quite recently simplified and very much improved his instrument.

The edges of the cleft were pared after the passage of the sutures. On the following day one of the upper sutures cut out, which was again due in part to an incomplete division of the levator palati muscle on one side. But in four or five days the parts were more firmly united than before, though not sufficiently, and on the 13th of August I operated again. This time the levatores palati were freely and thoroughly severed, together with the muscles forming the pillars of the fauces. The hemorrhage was not considerable, and readily checked by gargling with ice-water. The remaining ununited cleft of the soft palate was pared on each edge, and after liberating some of the tissue of the gum on both sides of the mouth, five or six sutures were put in, and as thickly as possible, at about a third of an inch from the pared edges. The wires were left in until about the eighteenth day, in the mean time renewing some of them every third or fourth day, with a curved semicircular needle of my own, intended for passing the silver wire directly and without previously using silk sutures. During the after-treatment the palato-pharyngeus and palato-glossus on each side were cut twice to relieve undue strain on the parts. On removing the last sutures the parts were found to be firmly and solidly united, and the patient was extremely well satisfied with the result. She was, however, desirous that the closure of the chasm in the hard palate should be attempted by another operation, which was essayed on the 2d of October, and which subsequently failed on account of gangrene of the flaps. This was prevented from spreading to the rest of the mouth by the frequent use of strong creasote water. On November 16th uraniscoplasty, or, more briefly, uranoplasty, was attempted by *renversement*, in which I detached

Fig. 1.



the muco-periosteal membranes from the gums. I experienced great difficulty in a part of this operation, as the patient, who was under the influence of chloroform, could not aid me by voluntary efforts at opening the mouth and depressing the tongue. There was considerable hemorrhage, but it was controlled by pressure on the part, and ice held in the mouth. The hemorrhage was caused by the section of the descending palatine artery, where it courses in the groove along the line of union of the alveolar process of the superior maxilla with the horizontal process of this bone. In this case, however, there was only a slight projecting ledge of bone in front to represent this horizontal process, and none on the sides of the chasm, which is accurately represented at Fig. 1, as it appeared before any operation was assayed.

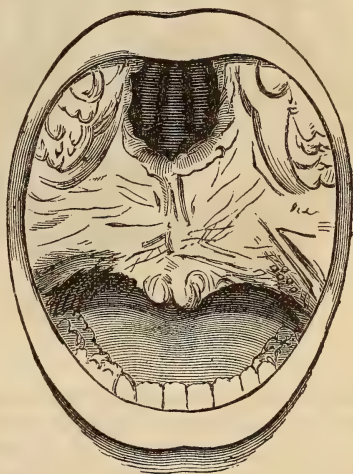
The detaching of the mucoso-periosteal membranes was done with a very narrow periosteal elevator, and I am of the impression that I improperly resorted to the bistoury when the elevator should have been used in its stead. On the second day after the operation the patient experienced

the peculiar smell of gangrene, which was immediately traced to the point at which the bleeding had occurred. This disease was again effectively checked by the same means which had been previously used.

About the eighth or ninth day afterward, Dr. Elsberg, of this city, and Dr. Cutter, of Boston, visited her with me, and, notwithstanding the partial destruction of one of the flaps, the result appeared at that time to be very good. However, these flaps soon shrank away, and the only effect of this last operation was the narrowing of the cleft in the hard palate.

On the 31st of last January, at the meeting of the Medical Journal Association, she was seen by most of the gentlemen who were present on that occasion, and the condition of the parts at that time was such as is illustrated at Fig. 2, which exhibits very well the fleshy bridge formed by staphylorraphy.

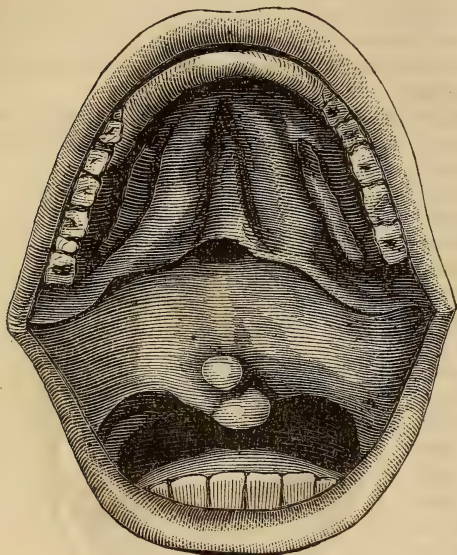
Fig. 2.



On the 12th of March, with the very valuable assistance of Drs. Elsberg, Erskine Mason, Raphael, and R. O. Mason, I resorted to an operation similar to Langenbeck's method for closure of cleft of the hard palate: The muscles of the palate were divided with a sickle-shaped knife; and with double-edge knives slightly curved on the flat—one of which was sharp-pointed, and the other probe-pointed—I thoroughly detached the soft palate from the hamular process and inner pterygoid plate. Chloroform was then administered, and the mouth kept open by placing between the teeth a cork, which was prevented from the danger of falling into the throat by being secured to a string. An incision was made close to the teeth, through the mucous membrane and periosteum down to the bone, extending from very slightly beyond the last molar tooth to the place of the external incisor. A similar incision was made on the opposite side. An instrument with a small cutting blade, bent at right angles, was passed up through the opening in the hard palate, and a horizontal incision, made a little above the groove in which lies the horizontal portion of the superior palatine artery, and this incision, in circumscribing the bony fissure, ran slightly above its edges on the sides, but coursed along the border of the slight projecting ledge of bone in front. The detachment of the periosteum was commenced at the lateral incisions with an excellent instrument, similar in shape to an oyster-knife, and such as Dr. Louis A. Sayre uses in detaching the periosteum in hip-joint operations. This instrument is of solid steel, quite heavy, and slopes gradually from its middle, where it is very thick, to wedge-like extremities which are very slightly curved. Small and light elevators were used to complete the detachment of the periosteum, and the flaps could then be made to meet without undue traction. I experienced a little difficulty in paring the edges, from not having a suitably curved knife.

But the passage of the sutures occasioned considerable perplexity and delay. Silver wire was used for the four sutures; the fourth was removed

Fig. 3.



too soon, very much to my regret, as it appeared to have cut out; but such was not the case. Had I used Langenbeck's needle, or one which I have since caused to be made, which, with the exception of being sharp at the point, resembles Stone's aneurism needle, I should have had no difficulty with the passage of the sutures. The entire closure of the cleft was not effected at this operation. But, on the twelfth day afterward, the three remaining sutures were removed, and the parts found to be firmly united, except a small aperture above the soft palate. Fig. 3 shows the condition of

her mouth after the removal of the sutures.

On the eighteenth day, the side cuts, into which bits of cotton had been stuffed to extend the line of union, were completely healed, and the parts exceedingly firm. But near the extreme anterior part of the newly-formed vault, one of the suture holes, which had suppurated, left a tortuous and scarcely perceptible hole which is closing spontaneously.

I can readily perceive, now, how the failure to close the aperture, just above the soft palate, could have been obviated by excising a little of the tissue from the centre of the soft palate, by a V-shaped cut, and extending the lateral incisions to the hamular processes—taking care, however, not to detach the flaps from immediately around the posterior palatine canals, which are two of the three vascular points from which the vitality of the flaps were maintained, the third point corresponding to the anterior palatine canal. As the patient is desirous that this hole shall be closed, I do not anticipate much trouble in completely occluding it, and then I shall be better enabled to test the final result on her speech, which, before any operation was attempted, was unintelligible to strangers, and now, though nasal, is perfectly distinct and intelligible. I do not expect, in the case of this patient, an exemption from nasal tone, as the exceedingly atrophied condition of the muscles of the soft palate and the great extent of the cleft were exceedingly unfavourable to a good result. The shortness of the new palate precludes the possibility of obtaining a complete occlusion

of the vocal sounds from the nasal cavity during speech. There was no bleeding of consequence during this operation; but ice-water spray was occasionally thrown on the parts. The reaction on the second day soon abated after the application of leeches. During a few days there was some pain and swelling about the left antrum, and a purulent discharge from the nostril on that side: creasote-water spray gave relief to the pain, and thoroughly cleansed the nares.

ART. XI.—*Dislocation of Right Femur, complicated with Fracture of Neck of Bone; successfully treated by Manipulation.* By J. TUNNECLIFF, Jr., M. D., Jackson, Michigan.

DECEMBER 24th, 1866, Edward Humes, farmer, aged about 30, in good physical health, was employed in felling trees in a low woodland partially covered with water. A black ash tree, nine inches in diameter at the base, had been lodged, it was supposed, firmly against another tree. A short time subsequently, while standing on the ice engaged in felling a tree in the immediate vicinity, the one which had been lodged fell, and struck Humes on the left shoulder, crushing him to the earth, and driving his feet through the ice. As he fell his body inclined to the right, and the right trochanter major struck with great force on the solid ice. He was unable to rise. The black ash tree about six inches in diameter where it crossed his body, was moved by his fellow workmen, and he was lifted from the position and carried to his house. Drs. Woodworth and Lord, of Leslie Village, who were called to him, found dislocation of the right femur into the ischiatic notch with fracture. The exact point and line of fracture they could not determine. The limb was shortened one and a half inch. The right knee was inclined to take position toward its fellow, and above it. The right foot was inverted, and pointed to the ankle of the left foot. The limb, when grasped by the surgeon, was found to be quite movable. Rotation, abduction, adduction, or even extension, could be readily made, and with but little pain. Crepitus was distinctly felt during these movements in certain positions of the limb. Luxation was evident, for the head of the bone could be distinctly felt in the ischiatic notch, and yet by extension the foot could, with facility, be brought down to the side of its fellow, and when the force was withdrawn it readily took the position first described. The right trochanter was about one and one-half inch above the level of the left, and when the limb was rotated while in a quiescent state, the head of the bone could be distinctly felt rotating in unison with it.

Here was a dilemma in which I apprehend few surgeons have been placed, and I have not been able to find an account of a parallel case. Here was a luxated bone to be replaced, and a fracture to be united; and as the former was utterly impracticable until the latter was accomplished, Drs. W. and L. wisely, as I think, decided to apply the long splint, and dress the limb in the position most favourable for a reunion of the fractured portions, and leaving the dislocation for future disposal.

January 24th, one month after the injury, Dr. W. called at my office, and requested me to see Humes the next day with Dr. Leslie and himself. I found the patient comfortable, without pain or evidence of local inflammation, and his most earnestly expressed wish was, that we should "let him alone, as he felt very comfortable, and thought he was doing first-rate." Upon removal of the dressings I found the same shortening and oblique position of the limb as described above. The head of the bone was plainly felt in the ischiatic notch, and accompanied the body of the bone when rotated. I must confess that I had at first some doubt about the alleged fracture, but Drs. W. and L. both assured me most earnestly that they could not be mistaken on that point, as both had felt distinct crepitation on their first visit, and then the great mobility of the limb at that time would seem to confirm that view. I observed further that pressure upon the neck of the bone at the base of the great trochanter, elicited evidence of tenderness at that point, and I felt forced to acquiesce in the views of the attending physicians. The question now presented to us was: Is such a dislocation complicated with fracture of the neck of the femur susceptible of reduction? If so, when and by what means can it be accomplished? Is it probable that sufficient ossification has taken place here to justify the use of pulleys, or any other means of extrusion, in returning a femur four weeks out of its socket? Ossification is much more rapid and efficient in some subjects than others, as is well known. If left too long unreduced, local adhesions in its new position would most likely render futile any efforts to reduce it; and if physical force was applied too early, we should most certainly break up the imperfect union of the fragments from recent ossification, and utterly fail to return the head of the bone to its socket. In view of all these facts I advised that the dressings be replaced, and two weeks farther time be given to the process of ossific union.

In the mean time my mind was seriously exercised as to what course it were best to pursue in the case. If we secured efficient union, it is true we might reduce the dislocation of the head of the bone with the aid of pulleys; but if in using them the recent union of the fragments was broken, we should be in a bad predicament.

I was summoned to the patient a second time on February 2d, thirty-eight days after the accident, and found him in excellent condition. He had had no fever or any evidence of local inflammation. The ossific union at the line of fracture appeared firm. The limb seemed firmly fixed in the oblique position first described. Careful measurement showed it one and one half inch shorter than its fellow. We placed him on the left side on a lounge, passed a counter-extending band from the perineum to a staple in the floor behind him, set up pulleys to be used if necessary, secured full anæsthesia with a mixture of chloroform and ether, and then proceeded as follows: I grasped the leg with my right hand near the ankle, placing the left over the head of the bone in the ischiatic notch; flexed, extended, abducted, adducted, and rotated the bone, until I was convinced that any and all recent attachments existing between the head of the femur and surrounding tissues in its new position were destroyed. Dr. W. then took charge of the limb and followed my directions in its movements, while I took in charge the head of the femur. The leg was first flexed to a right angle with the thigh, a semicircular upward movement was then made with the limb over the opposite limb to a little above the umbilicus. The right leg was then abducted with the result of course of rotation of the femur inward and the head

of the femur outward. When this last motion was made I distinctly felt the head of the bone leave the ischiatic notch, pass downward and forward to the rim of the acetabulum. I followed it with my hands, pressing it in the direction it should take. Dr. W. then abducted the thigh with considerable firmness, but without expending great force, and brought the limb down to an extended position. I felt the head move as the limb was brought down, and thought it had passed into the socket; as I removed the pressure of my hands, however, it glided back into the ischiatic notch. It had evidently *nearly* passed the summit of the rim of the acetabulum. We all felt greatly encouraged. The movement was renewed exactly as before described, with perhaps a little more energy and decision than at the first, particularly on my own part, for I now pressed against the great trochanter with both thumbs, and with nearly all the force I could summon; and as the limb was passing downward to the extended position, the head of the bone returned to its socket with a snap so audible, that the other surgeons were aware of its return as soon as myself.

I felt confident that we had succeeded admirably in the reduction; but I was much disturbed by a peculiar grinding sensation, mingled with distinct crepitus, as the head of the bone crossed the rim of the acetabulum. I feared that we had broken the recent adhesions at the point of fracture. This, upon examination, proved to be the fact. The limb now lay in its normal position, apparently of the same length with the opposite limb. But close measurement showed it to be one-half inch shorter. Abduction and adduction could be made readily, but rotation, when slight extension was made, disclosed distinct crepitus. We had accomplished the reduction, and we now had to treat a fracture of the neck of the femur. We dressed the limb with the long outside splint, extending from below the foot nearly to the axilla. A foot-piece was attached, provided with slits for the attachment of the extending band. Ample cushioning was applied, and counter-extension made from the perineum. We left him quite happy that his limb looked and felt so well; and as to ourselves we were equally so, in view of the fact that our efforts had in the main been crowned with success.

Five weeks from the above date Dr. W. informs me he removed all dressings, and our patient could walk with one crutch, and measurement showed but half an inch shortening of the limb. He has progressed favourably since that time.

Before closing it may be well to add my own theory as to how this peculiar form of dislocation complicated with fracture was produced. I am convinced that the force of the blow from the black ash tree dislocated the hip, and that subsequently in the fall upon the right trochanter on the solid ice, the neck of the femur was fractured near its junction with the body of the bone. I feel certain that had we attempted the reduction by the use of pulleys, we should not only have broken up the recent ossific union, but have left the head of the femur in its new position in the ischiatic notch. And there it must have remained, as it was not only doubtful if the patient would consent to any further surgical interference, but also if any surgical effort could have been of any avail. In view of these facts I leave it to my professional brethren to decide, if the question of reduction of dislocations by manipulation, as opposed to forcible

extension, may not only be worthy of their most earnest consideration, but even of the first trial in all cases of luxations of important joints.

In conclusion, we must add that we fully indorse the remarks of Prof. Gross as to the great obligations under which the profession are to Dr. W. W. Reid, of Rochester, New York, for having first clearly shown, by a series of admirably conducted experiments, dissections, and clinical observations, that dislocations of the hip-joint may be safely, certainly, and expeditiously reduced by manipulation alone, without any extraneous aid.

ART. XII.—*Description of a Specimen of Internal Ossific Deposit in a Case of Osteo-Myelitis after Amputation.* By JOHN H. PACKARD, M. D., one of the Surgeons to the Episcopal Hospital, Philadelphia. (With two wood-cuts.)

IN the Museum of the College of Physicians of Philadelphia there is a specimen, presented by me in 1866, which illustrates a feature of osteo-myelitis not hitherto spoken of by writers. Hence, although the clinical history of the case is very meagre, I think the bone itself worthy of a detailed description.

It is a portion of the femur, removed by a second amputation from a patient whose thigh had been taken off below the middle a number of months before, at a military hospital. The stump of the bone became affected with osteo-myelitis, and was much enlarged in circumference, a tubular sequestrum protruding through an opening in the soft parts. Such was the local condition when, in the fall of 1865, he entered the Episcopal Hospital during my term of service. On the 21st of November I operated, making anterior and posterior flaps, and removing three inches of the cloaca.

On sawing through the femur, the portion taken away was found to consist of three concentric layers: the cloaca, three inches long; the sequestrum, three and a half inches, and within the latter a very delicate and vascular tube of new bone.

On examining the section of the pelvic portion of the femur, the end of the tubular sequestrum was readily seen, and upon grasping it with forceps another four inches of dead bone, forming an incomplete and very irregular cylinder, was drawn out. It was entirely by itself, containing no central ossific deposit.

The state of things now described will perhaps be better understood by reference to the annexed diagrams. Fig. 1 represents a longitudinal section; *a b* is the line of division by the saw; 3, the sequestrum; and 4, the

contained tube of new bone. Fig. 2 represents a transverse section ; 1, the periosteum ; 2, the cloaca ; 3, the sequestrum ; 4, the internal new layer of bone ; 5, the endosteum.

It will at once be seen by those familiar with specimens of necrosed bone, that the peculiarity of this one lies in the development of the tube of

Fig. 1.

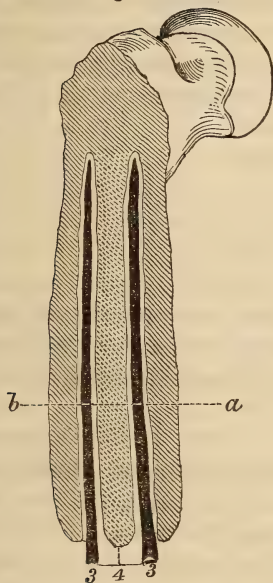
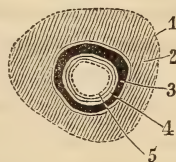


Fig. 2.



osseous substance within the sequestrum. Such a formation has not been described by any writer whose works have as yet come under my notice ; nor have I, in inquiries among pathologists, found it recognized as of common occurrence. And yet it seemed to me hardly possible that the conditions in this case could have so far varied from those which generally prevail, as to have given rise to an entirely new phenomenon. I therefore, during a recent visit to the U. S. Army Medical Museum in Washington, carefully examined a number of specimens of osteo-myelitis, and found that an internal deposit of bone was present in a large proportion of them.

No other explanation can be given of the production of this central tube, than that it is formed by the agency of the endosteum or medullary membrane. And it must result either from an actual ossification of this fibrous expansion, from a deposit of bone-corpuscles on its interior surface, or from such a deposit on its outer side. The last of these suppositions seems to me to be the correct one.

An examination of Fig. 1 will show why the tube of new bone was observed only in the removed portion ; its upper part was left behind, attached, on the withdrawal of the corresponding part of the sequestrum.

My own belief is that such a formation exists in many, perhaps in all, cases of osteo-myelitis with necrosis, and that it would be detected by careful scrutiny, especially if the sequestra were sawn open so as to expose their cavities. It is in the hope that such examinations may be made, that this report is offered.

In conclusion, I would merely allude to the descriptions given by the older writers, of the union of fractures by an external ring and an internal pin, the latter supposed to be deposited by the endosteum. May it not be that the medullary membrane does aid in the process by giving rise to the formation of an internal annular layer of bone, corresponding to the external callus due to the outer fibrous envelope?

PHILADELPHIA, 1415 Spruce Street, April, 1868.

ART. XIII.—*Observations on some Recent Contributions to the Statistics of Excisions and Amputations at the Hip for Injury.* By GEORGE A. OTIS, Assistant Surgeon U. S. Army. (Communicated by the Surgeon General.)

In the Proceedings of the Pathological Society of Philadelphia for December, 1867, as printed in the *American Journal of the Medical Sciences* of April, 1868, it is stated at page 410, that—

“Dr. S. W. Gross exhibited a specimen of gunshot wound of the head and neck of the left os femoris, which had been removed by operation by Dr. F. H. Gross, of Philadelphia, formerly Surgeon U. S. Volunteers, and Medical Director of the Fourteenth Army Corps. By some strange oversight this operation has not been included among those reported by Assistant-Surgeon Otis, U. S. A., in Circular No. 6, S. G. O.”

Then follows an abstract of the history of an intermediate excision of the head and neck of the left femur, comminuted by a conoidal ball, in the person of private Michael Welsh, Co. H, 10th Kentucky Volunteers. A rejoinder to this charge of negligence may perhaps not be considered inappropriate.

The report on the nature and extent of the materials available for a surgical history of the war, included in Circular No. 6, S. G. O., 1865, was published in October of that year, a few months after hostilities had closed, and was professedly a preliminary and prefatory report, in which all pretension to completeness was repeatedly disclaimed. Had the clerical force at the disposition of the Medical Bureau been quadrupled, it would still have been impracticable to have classified and digested the mass of reports received during the vast campaigns of 1864 and 1865, as fast as they were transmitted. It was desirable, however, to make known to the government and to the profession the value of the data collected by the

Medical Department, and General Barnes accordingly directed the compilation of Circular No. 6, S. G. O., 1865. After a survey of the extent and nature of the materials under his charge, the compiler of the surgical portion of that work reports to the Surgeon-General the progress made in arranging the data relating to each class of injuries; points out the large proportion of cases with undetermined results; indicates the time required for the preparation of the English report of 12,094 wounded in the Crimean war, and of the French report of 26,681 wounded in the same war; mentions that the returns of wounded in the United States armies already examined give an aggregate of 169,974 wounded; and, on every page, endeavours to show the impracticability of gratifying the natural desire of the public for immediate information as to the results of the surgery of the war, without the greatest sacrifices of accuracy and completeness. In relation to a few of the surgical questions of especial interest, such as the treatment of gunshot fractures of the femur, the propriety of excisions of the larger joints, and coxo-femoral disarticulation, an attempt was made to satisfy professional impatience by giving tabular statements of all the facts on these subjects then in the possession of the Bureau, so far as was consistent with the space and time to which the compiler was restricted. But these were supplied, with the reiterated caution that the results were incomplete, and that deductions from them would be premature. To show that this caution was not unfounded, it may be stated, that the number of excisions of the upper extremity of the femur for gunshot injury reported in Circular No. 6, S. G. O., 1865, was 32, and that the number now recorded is 65; that instead of 575 excisions of the head of the humerus then reported, very complete abstracts of 808 examples of that operation have now been collected; that in place of 23 memoranda of cases of amputation at the hip-joint in that circular, one of which, on further inquiry, proved to be apocryphal, while two were inserted as the report was passing through the press, the Surgeon-General's Office was able to publish in Circular No. 7, of July, 1867, not less than 53 abstracts of authentic cases of this mutilation, with brilliant results in secondary operations; some of which operations had not been undertaken, or were still undetermined at the date of the first report.

Although no claim to completeness was set forth in connection with the tabular statement of excisions of the head of the femur for injury recorded in Circular No. 6, S. G. O., 1865, it can be proved by documents on file that all cases that had been communicated to the Surgeon-General's Office at that date were included in the table. It is true that as many more cases have since been collected; for, on these important subjects, the Medical Bureau endeavours to investigate exhaustively, and even to obtain the experience of the surgeons of the southern armies. In tracing the results of the great surgical procedures which are still *sub judice*, extensive private correspondence is employed, and voluntary aid of former volunteer

surgeons, and of the examiners of the Pension Bureau, is sought, as well as the agency of the officers of the regular medical staff.

As regards the operation by Dr. F. H. Gross, formerly Surgeon U. S. Volunteers, and Medical Director of the Fourteenth Army Corps, the simple fact is that the operator did not report the case to the Surgeon General's Office. His report as Medical Director of the Fourteenth Army Corps contains no mention of it, and it does not appear on the report of the General Field Hospital of the Fourteenth Corps at Chattanooga.

It is true that on the casualty list forwarded by General Rosecrans's Medical Director, Surgeon Glover Perin, U. S. A., the entry appears: "Private Michael Welsh, Co. H, 10th Kentucky Volunteers, gunshot wound of left hip, exsection of head of femur;" and that a letter was immediately written to Surgeon Perin, asking for the particulars of the case, who replied that no particulars could be ascertained; from which it may be inferred that Surgeon F. H. Gross had made no report of his important operation to the Medical Director of the Army. The entry in the casualty list, which document is made out for the information of the Commanding General primarily, and is not remarkable for its diagnostic data, was not deemed a sufficient basis on which to report a case of the magnitude of an excision of the head of the femur, when the name of the operator and all the attendant circumstances were unknown. There was a Circular Order issued by the Surgeon-General's Office on June 9, 1862, directing all medical officers of the Army to transmit special reports of important operations, together with the pathological specimens, to Washington, to form an Army Medical Museum; and most of the Medical Directors carefully enforced this order. That it was not complied with in the case under consideration is sufficiently attested by the fact that the specimen was preserved, and was exhibited by Dr. S. W. Gross, December 26, 1867. The oversight in the case has been on the part of Dr. F. H. Gross, who neglected to report his operation, and appropriated to himself a pathological specimen which it was his duty to have forwarded to the Surgeon General's Office. If Dr. F. H. Gross had made mention of the case in his report of the operations of the medical department of the Fourteenth Corps, the Surgeon-General's Office would have taken measures to obtain possession of the facts of the case and of the specimen, while the Doctor was still under military authority.¹

Leaving this unprofitable subject, it is worth while to inquire for a moment into the exactness of the statistical researches of Dr. S. W. Gross, on the relative value of excision of the head of the femur and amputation at the hip-joint in military surgery, which he appends to his report of this case.

¹ On June 3, 1868, after this paper was in print, the specimen in question was forwarded to the Army Medical Museum by Dr. F. H. Gross. It is numbered 5442, of the Surgical Section.

Examining in detail the table of 137 amputations at the hip-joint for gunshot injury, printed at p. 445 of the October number of the *American Journal of the Medical Sciences* for 1867, we find that one of the two alleged primary successful operations of the late war, a case originally published by Professor F. H. Hamilton as performed by Dr. Fenner (*Military Surgery*, 1865, p. 482), and cited also in Circular No. 6, S. G. O., 1865, is now known to be fictitious. Of the two operations attributed to the U. S. Navy, one, as Dr. Horwitz has informed the writer, was that of Dr. Gorgas, or Case XIII., p. 50, Circular No. 6, S. G. O., 1865, which consequently is counted twice by Dr. Gross. The other is Dr. McLean's case (No. 1, of Circular No. 7, S. G. O., 1867), which is doubtless counted twice in Dr. Gross's later series of 166 cases. MM. Arlaud and J. Roux are credited with five successful secondary operations, only two of which were performed for gunshot injury, as appears from Roux's paper "*De l'Ostéomyélite et des Amputations Secondaires*," p. 98. On Demme's authority a secondary successful operation is ascribed to Professor Sédillot, who thus commences the description of the case in a memoir addressed to the Academy of Sciences of France, July 5, 1841: "Antoine Rambourg, fusilier, etc. . . . fut atteint, en Juillet, 1837, d'une fracture du fémur droit, compliquée de plaie, dans une chute d'un premier étage," another illustration that it is not always safe to quote at second hand. Of the five primary fatal operations credited to M. Sédillot, only one was performed by him, as clearly appears from his memoir in the *Annales de la Chirurgie Française et Étrangère*, t. ii. p. 279. The other four he reports from hearsay as performed on "four of our soldiers of the army of Africa," very possibly referring to the operations of Hutin and Goyon, likewise enumerated by M. Légouest and Dr. Gross. The successful primary operations attributed to Blandin, Bryce, and an English surgeon at Aboukir, and the three unsuccessful operations ascribed to Blandin, are of very doubtful authenticity, and are rejected by those writers who have examined the subject the most carefully. In other words, 8 successes and 16 cases of the 137 in Dr. Gross's table are either duplicated or reported on insufficient evidence.

Dr. Gross's table of 58 excisions of the head of the femur for gunshot injury will bear examination little better. Excluding the cases recorded prior to the late war, already tabulated by Textor, Lefort, Hodges, the compiler of Circular No. 6, S. G. O., 1865, and others, the thirty admitted cases reported in Circular No. 6, and six cases collected from European authors, we have eleven cases in this table cited from Professor Paul F. Eve's paper in the *Transactions of the American Medical Association*, vol. xviii. p. 251, in which that distinguished surgeon undertakes to collect the operations of excision of the head of the femur for injury in the southern service, and to prove that in the U. S. Armies the operation was attended with a "fatality nearly four times greater than on the southern side." Now of these eleven cases, "with three cures," the

alleged successful operations ascribed to Professor Miltenberger and Dr. Asch were not excisions of the head or upper extremity of the femur at all, and if they had been, it is difficult to understand how they would indicate the superiority of southern surgery. The facts in the first case, that of Private W. F. Pumphrey, Co. H, 1st Virginia Infantry (*Confederate States Medical and Surgical Journal*, vol. i. p. 26), were investigated by the Surgeon-General's Office, long before the publication of Circular No. 6, S. G. O. The patient was under the care of Dr. Henry S. Hewit, Senior Surgeon of the U. S. Volunteer Staff at Hospital No. 5, at Frederick, Md. The injury was a comminution of the trochanteric region of the left femur by a musket-ball, received at South Mountain, September 14, 1862. The hospital register and a letter from Dr. Hewit both state that the treatment consisted in cleansing the wound from bits of clothing and splintered bone, and placing the limb in a fracture apparatus. Dr. Hewit says explicitly that no operation was performed. On December 12, 1862, the patient was transferred to Baltimore to be paroled or exchanged. He was there under the charge of Professor Miltenberger, who, in a letter to the Surgeon-General's Office, dated March 20, 1868, states that no secondary operation was performed. A letter from Assistant-Surgeon M. J. Asch, U. S. A., informs the writer that Dr. Asch did not perform the operation of excision of the head of the femur after Gettysburg. In the case of Private John Durbin, 9th Alabama Reg't, with a fracture of the upper part of the shaft of the femur, he removed fragments and excised the sharp extremities of the broken shaft, and this is probably the case cited by Drs. Gross and Eve, on the authority of Dr. D. D. Saunders. It is not worth while to waste criticism on the fatal cases, but the third "cure" among the eleven cases admitted by Dr. Gross from Dr. Eve's table, we find recorded as follows by the latter: "An officer; gunshot fracture of neck of femur; wound dilated at entrance, and spiculæ removed with saw and forceps; lingered for months, but finally recovered with a limb four inches short. Operator: Surgeon B. W. Avent;" on which it may be said that nothing indicates that the hip-joint was involved either by the projectile or by the surgeon.

And on such data as this Professor Eve would have us admit that the operations of surgeons of the U. S. Army had "a fatality nearly four times greater than on the southern side!" Dr. Gross includes these cases in tables which he assures us were "prepared with great care," and include authenticated cases only, and invites us to decide on the relative value of surgical operations of magnitude by fractional percentages deduced from these tables! It is the profound conviction that confidence in surgical statistics is destroyed by such abuse of the numerical method, and that an admirable means of attaining truth and eliminating error is thereby discredited, that has led the writer to extend this analysis so far.

TRANSACTIONS OF SOCIETIES.

ART. XIV.—*Summary of the Transactions of the College of Physicians of Philadelphia.*

1867. June 5. *Drainage Probe.*—Dr. H. LENOX HODGE exhibited a *drainage-probe*, made of silver pure enough to be perfectly flexible, and terminating at either end by an olive-shaped bulb. Its diameter is the same as that of the ordinary surgical probe, and its length six inches. A number of different sizes would at times prove useful.

It is adapted to the same class of cases as Chassaignac's "drainage-tubes," but possesses several advantages over them. Being made of silver, its presence causes no irritation to the tissues; it is not affected by any climate; it is non-absorbent and thus keeps pure and clean. Being a solid probe, the pus or blood cannot collect and block up the passage as is done in a tube. It does not swell like lint and other vegetable structures, and thus tightly close the orifice, confining the pus. *The fluid always flows along its sides and escapes.* It is readily inserted into any opening made by the knife or occurring spontaneously, and with ease may be carried to the extremity of a sinus or abscess. When inserted, it can be retained in its place by a strip of adhesive plaster; or better, when practicable, by making a counter-opening and, after carrying the probe through, bending both of its ends. The great advantage of draining an abscess and cavities containing fluids, and the many difficulties of accomplishing this, are conceded. The employment of this drainage-probe will do much to remove them. Indeed, in certain disorders, such as strictures of the lachrymo-nasal duct, this plan has long been employed with success; the fluids have been found to pass steadily along the sides of the old "style" even in tight strictures.

The drainage-probe causes so little irritation, and is of such marked benefit, that the patient himself will at once appreciate its value. Even in mammary abscess it causes no inconvenience; pus soon ceases to be formed, milk flowing along the probe instead, and the woman continues to nurse her child.

Bromide of Potassium in the Sickness of Pregnancy.—Dr. PACKARD stated that he had employed the bromide successfully in several cases of this kind, when the sickness had been manifestly due to reflex irritation of the stomach, and in which most if not all of the other remedies in common use had failed. He believed that after the removal of any gastric disorder, if such existed, the bromide would act here just as in other cases of nervous disturbance, as, for example, in allaying neuralgia, or in producing sleep. The dose given had been the ordinary one, viz: gr. xx every three hours, until the symptoms began to yield.

The fact that the idea had seemed new to several gentlemen of experience in these matters, induced Dr. P. to bring it to the notice of the Fellows of the College.

Nov. 6. Case in which Acupressure was applied to the Femoral Artery at the Fold of the Groin.—Dr. JOHN ASHHURST, JR., said: I desire to invite the attention of the College to a case which seems to me to furnish a good example of the occasional preferability of Sir James Y. Simpson's method of acupressure over any other known means of arresting hemorrhage. While in the country during the past summer, I was called in great haste to the farmer's house, less than half a square off, to see a child who, it was reported, was "bleeding to death." I ran to the spot as quickly as possible, and found a little girl about ten years old bleeding profusely from a sloughing abscess on the inside of the right thigh, near the fold of the groin. Making digital pressure, I swept away the clots which were accumulated in the rocking-chair in which she sat, filling the space between her thighs, from her pubes to her knees. I then found that the abscess had extended under the skin to the position of the femoral vessels, about an inch below Poupart's ligament. Pressure upon the femoral artery at this point controlled the bleeding, which instantly recurred upon the pressure being removed. I had no instruments, except those in my pocket-case, no ether or chloroform, and (a still greater deficiency) no skilled assistants. Delay was most dangerous, for the loss of a very few ounces more of blood would have proved instantly fatal, and even had I been surrounded with all the appliances of a well-ordered hospital, the incisions and dissection which would necessarily have preceded the ligation of the bleeding vessel, would have been in themselves greatly to be dreaded. In this emergency I procured from the farmer's wife a strong darning-needle of more than ordinary dimensions, and keeping up digital pressure with the thumb of my left hand, introduced the needle deeply a little to the inside of the line of the femoral artery, and then, depressing its eye, carried the point of the needle beneath the vessel and brought it out about three-quarters of an inch exteriorly to its place of entrance.

The femoral artery was thus "acupressed" by Simpson's first method, immediately as it emerged from beneath Poupart's ligament. The hemorrhage was entirely controlled, and the little patient carried to her bed and made as comfortable as circumstances permitted. The attending physician, a practitioner of the neighbourhood, arrived about an hour afterwards, and, of course, took charge of the patient, whom I did not see again. I am, however, enabled to state that a slight hemorrhage, apparently brought on by injudiciously moving the patient, took place on the succeeding day, but ceased spontaneously. I presume it was from the distal end of the ulcerated vessel, the collateral circulation having probably been established during the night. These hemorrhages were but late incidents in the course of a long and enfeebling illness, the patient having for many weeks suffered from profuse suppuration and extensive bed-sores. She died without pain, and seemingly from simple exhaustion, about twelve hours subsequently to the second hemorrhage.

I have thought it my duty to report this case, especially as I have never been an advocate for the general employment of acupressure. In the large majority of cases, I certainly think that the ligature is in every way preferable to the pin or the needle. But there are some, and I think that which I have just narrated is a case in point, in which Prof. Simpson's method seems to me to unite the requisites of treatment, *tuto, cito, et jucunde*, more satisfactorily than any other. Had it been practicable, it would doubtless have been better in my case to enlarge the

wound, search for the source of hemorrhage, and apply ligatures above and below; but during this operation the patient would inevitably have bled to death.

I may perhaps remark, as a matter of some practical importance, that in applying acupressure to the femoral artery at the groin, the needle or pin should be passed from within outwards, as there is thus less risk of wounding the femoral vein.

United Fracture of the Skull of very Old Standing.—Dr. J. CHESTON MORRIS presented this specimen, with the following account:—

This specimen was obtained from a man who was a patient in the Pennsylvania Hospital when my father was resident there in 1824, and who, in gratitude for his kindness and care, left him his skull after his recovery. Thirty-six years subsequently, when his death took place, his widow, then a patient of mine, sent to inform me of the fact, and to state her willingness that I should take possession of the specimen. Accordingly, assisted by Dr. Packard, I removed the head and took it to the Pennsylvania Hospital, where it was carefully examined in the presence of Drs. Norris, E. Hartshorne, Packard, and myself. A large cruciform cicatrix extended across the scalp in the direction of the sagittal and coronal sutures. This was adherent in the portion where the bone is deficient to the tissues beneath. On carefully removing the scalp, a fissure between the parietal bones and the frontal, extending across the top of the skull for four inches in length, and at the widest place three-quarters of an inch in width was noticed. This aperture was closed by a firm membrane, adherent to the dura mater. The calvarium was removed by the usual circular method, with the dura mater, exposing the brain, which presented very little evidence of abnormal condition, except that in each cerebral hemisphere there was a cavity or closed sac on the upper surface completely lined by a serous membrane and containing, the one in the right hemisphere about half an ounce, the one in the left about two drachms of clear serum. The veins and sinuses were somewhat congested, and the brain was rather harder than normal. No evidence of fracture at the basis of the cranium was detected in the recent state; but when the skull was cleaned, I found a line of union extending from the margin of the foramen magnum across the left side of the occipital bone and the petrous part of the temporal bone and obliterating the left carotid foramen. The jugular fossa on this side is very much enlarged, as though there had been a great and long-continued obstruction to the flow of the blood through it, which eventually caused the excavation of the bone from pressure. The following is condensed from the notes taken by my father:—

“Case of Fracture of Basis of Cranium.—B. L., æt. 16, was admitted December 28, 1824, having a few hours previously received a severe injury of his head. Riding in a heavy cart loaded with rubbish, the horse became unmanageable, and turning quickly round a corner overturned the cart in such a manner as to catch his head between the front part of it and the street pavement. There was a slight scalp wound on the back part of the head. When I first saw him his pupils were contracted, pulse slow, stupor, but no stertor. There was effusion under the scalp, particularly near the front part of his head, and considerable hemorrhage from the left ear. His head being shaved, and a close examination made, no depression could be ascertained. He had been bled before admission.

Dr. Parrish, the surgeon in attendance, was sent for. The symptoms continued, the stupor rather increasing, for about three hours, when Dr. P., having arrived, made a crucial incision over the top of the head. On turning over the flaps, great effusion of blood was found, particularly at the point of junction between the sagittal and coronal sutures. On removing as far as possible the coagulated blood, the injury was found to consist in a separation of the coronal suture, placing the joining edges of the parietal and frontal bones about the fourth of an inch from each other. Very free hemorrhage took place from the point where the suture crosses the track of the longitudinal sinus, and by the flow of blood the stupor was evidently relieved. Several portions of matter, evidently medullary, were observed to have escaped. Simple light dressings were applied to his wound, and he was placed in bed. His whole surface became cold, particularly his extremities, and he was nearly pulseless. Warm barley water with a small quantity of wine was freely administered. Stupor increasing. In about three hours reaction took place. Towards evening his pulse grew firm and tense, 140 in the minute; skin hot, and he became very restless. Ordered pulv. nitrosi 3j: ft. pulv. x quar. sum. unam quâque horâ.

"29th, morning. Much as I left him last night. Bled him f3vij, and directed mag. sulph. 3ss, q. quartâ ho. ad deject. procur. Evening. Stupor rather less; great disposition to tear off dressings from head. Skin hot and dry, tongue furred, pulse tense. V. S. 3x. Salts have operated. Has taken no nourishment except the barley-water. Dr. P. saw him and directed a continuance of treatment. 30th, morning. Evidently better; pulse less frequent and has lost its tension. Skin dry and warm. Tongue coated with white fur. The room to be kept cool, dark, and quiet. Drinks freely of soda water and takes small quantities of barley-water. Suppuration has taken place in the wound; no escape of any kind from the fissure. 31st, morning. Pulse nearly natural; skin hot and dry; tongue still furred; no stupor, but great restlessness. Directed mag. sulph. 3ss, ut antea. His pupils have assumed their natural size, and contract and dilate on exposure to light or its exclusion. Purulent discharge from ear: has been allowed some roasted apples. Jan. 1st. During the night, hot and feverish; tongue is furred, and he is very restless; salts in full operation; to drink freely of cold barley-water, or mist. effervesc. 3ss, quâque horâ. Evening. Suppuration from wound increased, and he is now composed; pulse 100, free from tension; neither stupor nor delirium. 2d, morning. More easy; skin natural; pulse 90; tongue furred; still to adhere to rigid diet. Evening. His bowels not having been moved for twelve hours, directed mag. sulph. 3ij, ant. tart. gr. ij, succ. limon. f3ss, aquæ 3iv, sum. 3ss, q. s. h. Dr. P. saw him soon after and directed in addition V. S. f3vj. 3d, morning. Notwithstanding depletion last night, pulse full and tense; complains of sharp lancinating pain in temple, for which he was again bled f3x, to his great relief; his bowels having been once opened during the night, the attendant discontinued the medicine; directed it to be resumed and continued till his bowels should be freely moved. Night. Bowels freely operated upon; fine healthy granulations around edges of wound. 4th, morning. Again complains of pain in head; pulse rather tense; wound healthy. Night. Same saline mixture resumed. 5th, morning. Perfectly free from febrile symptoms; wound granulates finely; I now observed for the first time the parietal and frontal bones, yielding to the impulses of the brain,

moved freely on each other; this was also the case when he opened or shut his mouth; in dressing his head, found that much of the pus, which has been abundant for a day of two past, escapes through the fissure from the inside of the cranium. Night. Slight delirium: V. S. f3vj. 6th. This morning much better; delirium gone; pulse feeble; skin cool; tongue clean; bowels open; allowed rye-mush; no other change. Evening. Slight disposition to delirium, which went off during night, and he slept comfortably. 7th. Same; ordered mag. sulph. 3j. 8th. Continues to do well; appetite almost ravenous; allowed a little thin gruel. Evening. A little feverish, and complains much of head. Mag. sulph. 3j, to drink solution of bitart. potass. till bowels freely open. 9th. So soon as the salts administered last evening commenced operating he felt much relieved, and is this morning cool and comfortable; pulse natural; wound healthy; still motion between the fragments, and escape of matter from within. For accession of fever in after part of day, he was directed mist. efferv. f3ss, qu. semihorâ. 10th. Still better, though much purged by salts taken on 8th. 15th. Gradual improvement since last date; granulations have shot through fissure and prevent any further motion. 22d. Twenty-sixth day since accident; granulations cover completely the exposed bones; his diet was to-day improved by being allowed vegetable soup. From this time he continued to improve; the most unpleasant symptom being double vision; he is able to see perfectly with either eye, but with both sees double; to obviate this, he wears a blind over one eye; suppuration continued from the ear; he left the hospital Feb. 14. About the latter end of March I took from the anterior part of the parietal bones a portion about three inches in length and one and one-half inch in breadth, consisting of both tables. A number of small pieces were abstracted at various times. By the first of June his health was completely restored, and no complaint existed but of the loss of the function of the left ear; sight completely restored."

From this period until March 8th, 1830, he remained in good health; but then began to suffer from attacks of epilepsy, "which (Mrs. L. writes to me) Drs. Parrish and Morris supposed might be caused by pressure of some small portion of bone. Vegetable diet, anti-spasmodics, bleeding and cupping failed to give any relief. In 1837 the attacks returned at intervals of two weeks, except at midsummer and midwinter, when the interval was six weeks. Disposition restless. In 1842, slight symptoms of insanity showed themselves, the epileptic paroxysms having continued as usual, except during his prostration by an attack of diarrhœa. In 1845 he would take long rambles in the country, generally followed by a fit on his return; he took great pleasure in these rambles, and said that walking on the grass did not hurt his head as walking on pavements did. Excitement, or motion with the arms, or stooping, he always complained of as causing suffering. If seized with a convulsion while walking or standing, he would fall backward; if while sitting or lying, he would become stiff and strike his elbows." In 1848 he became decidedly insane, subject to fits of violent excitement, and suspicious of his family, so that it became necessary to confine him at the Trenton State Lunatic Asylum, where he remained twelve years, gradually sinking into a state of dementia.

I present also the fragments of the parietal bones, removed three months after the accident. A comparison of them with the fissure in the cranium will show how much the skull has grown since the fracture.

The severity of the injury to the skull and brain in this case is not paralleled in any other instance of recovery that I am acquainted with,

except perhaps that reported by Dr. J. M. Harlow. (See number of this Journal for April 1849, p. 546, and also by Dr. H. J. Bigelow in number for July, 1850, p. 13.) Dr. Jeffries Wyman informed me, in 1860, that this man had been a few years previously still in good health, and employed as a stage driver in Peru. It would be interesting to know if he has still escaped the usual fate of all those who have had mutilated brains, epilepsy, or insanity.

Dec. 4. Case of the late Dr. C. W. Pennock.—Dr. J. C. MORRIS read the following paper:—

It was the earnest and frequently expressed desire of this highly esteemed gentleman that his case should be studied with care, and the results recorded for the advancement of science and the possible alleviation of the sufferings of those who may be hereafter similarly afflicted. In accordance, therefore, with this desire and with regret only for a feeling of inadequacy on my part to do full justice to many of its remarkable features, the following account is presented.

Dr. Pennock was a man of large bony frame and excellent muscular development, of cheerful and benevolent disposition, clear, comprehensive mental perceptions, and in the fullest sense a philanthropist. Born of a vigorous, healthy, and long-lived family, and reared in the country under circumstances of comparative affluence, he at first devoted himself to agriculture and placed himself upon the farm, where he exerted himself so laboriously in ordinary farm labour as to give rise to great anxiety lest he should ruin his health. Not content with this, he opened a school for coloured people (in whose welfare he was deeply interested), in the evenings, teaching it himself after the labours of the day. These facts are mentioned as an index of the character of the man and as exhibiting the whole heartedness with which he threw himself into whatever he undertook. Finding the sphere thus opened before him insufficient for his benevolent wishes, he entered upon the study of medicine, which he prosecuted with the utmost zeal at the University of Pennsylvania, and, after graduating in 1829, visited Paris, where he remained until 1833. He then returned to Philadelphia to engage in practice. The assiduity with which he performed his duties in the Dispensary and at the Almshouse will be readily recalled by his colleagues: his attentions to the sick poor were unwearying and incessant. But it was to the scientific pursuit of his profession that he turned with the greatest eagerness, devoting himself to the study of auscultation and percussion, which were then attracting the attention of the medical public. Dr. Pennock repeated the experiments and vivisections of Dr. Hope and edited an edition of his works with copious notes. In the midst of these labours, he began in 1843 to complain of a sense of weight and numbness in his legs, which obliged him to forego his active duties and endeavour to recruit his failing powers. Everything which rationally promised relief in the way of treatment was tried until 1849, when he finally determined to withdraw from active life. Of his condition at that time and subsequently, Dr. Worthington, of West Chester, under whose care he placed himself, writes:—

“In the year 1849 Dr. Caspar W. Pennock came to reside in Howellville, Delaware County, having left the city to enjoy a country residence, and receive the benefits which such a location might afford. He had then been indisposed for a period of six years. During the year 1843 he was taken with a numbness in the left leg between the knee and ankle. The sensation produced was similar to that of a tight band around the leg about three or four inches in width. He

had been laboriously occupied during the summer with professional duties, so as to tax, to an unusual extent, both his mental and physical powers. He also suffered at times, during the season, with a slight diarrhœa. The feeling of numbness and sense of heaviness in the limb gradually increased under the treatment adopted, which consisted principally of counter-irritation by mustard and dry cups. Galvanism was also used. No treatment of this kind seemed to control the disease, which gradually increased until it extended to the whole limb. He was induced to try the 'cold water' treatment, which seemed to retard the progress of the disease more than any other remedy. The disease, however, still advanced, and in the course of a few years began to exhibit itself in the right leg, presenting the same symptoms as had been observed in the left. While employing the water treatment, it was accompanied with much exercise, and especially on foot, which probably was rather injurious than otherwise.

In 1853 he was attacked with pain, soreness, and swelling of the lower extremities, accompanied with febrile symptoms, and presenting all the ordinary symptoms of *phlegmasia dolens*. It ran a course of about three weeks, and under the usual treatment for this disease subsided—leaving him, however, ever afterwards unable to walk. From that time he was entirely confined either to the sitting or horizontal position. For several years the warm weather seemed to diminish his strength and increase his paralysis, so that during the winter he did not recover the loss sustained by the heat of summer.

When the disease reached the upper extremities, it began in the left arm, this being the side which was first and most affected. From the left arm it gradually extended to the right, until finally both arms became so much disabled as to prevent him from feeding himself during the last ten years of his life. Sensation was never lost in the paralyzed limbs, though somewhat diminished.

Little treatment for the paralysis was used in his case during the time he was under my observation. A careful system of living, strict attention to the condition of the alimentary canal, with good ventilation of his chamber, and, in suitable weather, a removal for a portion of the time into the open air—dry frictions to the limbs, which were faithfully applied, constituted the principal means employed in the medical treatment.

About five years before his death he had an attack of retention of urine, which was regarded as a partial but temporary paralysis of the bladder. The catheter had to be used for several days. With the use of diuretics, consisting of an infusion of buchu and uva ursi, and sweet spirits of nitre, this disease soon subsided, without any return.

A remarkable feature in his case, with such a long and constantly increasing paralysis, was the uninterrupted brightness of his intellect. His mind was always active, taking a deep interest in his profession, to which he was passionately devoted; and manifesting the deepest sympathy for the afflicted, and the warmest love for his numerous friends, with an earnest and patriotic solicitude for his country in her trials during the late rebellion. This clear and happy state of mind continued up to the latest period of his life.

About three weeks before his death he was attacked with other symptoms, and in my absence became the patient of Dr. Jacob Price, to whom I must refer for an account of his last illness."

Dr. Price writes us, "I was called to Dr. Pennock on the 20th of March last, and found him labouring under symptoms of influenza; there was also deficient action of the kidneys, and some tenderness to the left of and below the umbilicus, with a tendency to diarrhœa. The febrile action was slight. The bronchial symptoms abated somewhat after a few days, but the enteric steadily increased. Tympanitis was present from the first; it was, to a certain extent, his usual condition, although now much increased. The discharges were at first somewhat feculent, occasionally a transparent, colourless mucus; later they became dark and watery—four to six daily. The intestinal pain was not severe, unless the abdomen was pressed upon or handled. The tenderness, in the region indicated, was at times exquisite. His mind, from the first, was impressed with the idea that his disease was typhoid fever. The enteric tenderness, diarrhœa, tympani-

tis, bronchial disease, and sudamina (which were slightly present after the second week) gave support to this view, although the location of the tenderness, the absence of rose-coloured spots, and the condition of the tongue, did not sustain it. He was evidently, however, labouring under disease of a zymotic character. The pulse ranged from 80 to 110; his mind was always clear; his stomach was weak, and at times scarcely able to take the simplest nourishment.

Medicines (to which he was always very averse) were used sparingly. An alkaline diuretic for one day at first; afterwards strychnia one-eighth grain four times a day for several days; syr. lactucarii, with ext. cinchonæ, and, after the diarrhœa increased, bismuth, were the main measures resorted to. The strychnia seemed to control somewhat the tympanitis and the bronchial trouble, and the bismuth evidently restrained the diarrhœa. It was difficult to get him to take stimulants, and they were used to a very limited extent.

A specimen of urine, about a week before his death, showed no deposit when heated, or treated with nitric acid. Barreswil's test caused a slight flocculent green deposit, but no brown precipitate whatever. Microscopical examination showed a copious deposit of crystals of triple phosphate, and a few granules adherent endwise—probably urate of ammonia; also amorphous deposits of the same. His death occurred on Tuesday, the 16th of April, 1867, at 3 A. M. His mind was clear to the last."

Autopsy, performed April 18th, 1867, by Dr. John H. Packard, in the presence of Drs. Worthington, Price, and Massey of West Chester; notes taken by myself.

General appearance.—Body well formed—very slightly emaciated. Œdema of the left leg (slight): and also of both feet. Skin reddened on back from the neck to the sacrum. Left lateral and anterior angular spinal curvature, at 7th cervical to 2d or 3d dorsal vertebræ.

Examination of cerebro-spinal axis.—The body being placed in the prone position, an incision was made from the vertex downward, over the occiput and the spinous processes; another incision running forward behind each ear permitted the throwing forward of the scalp and downward of lateral flaps so as to expose the skull; the occipital bone was much congested; the lambdoidal and posterior part of the sagittal sutures were very vascular. A vascular spot was noticed on the right parietal bone about $1\frac{1}{2}$ inch from the sagittal and coronal sutures. On removing the calvaria a large quantity (at least six ounces) of serum (reddish from admixed blood) escaped. I believe this to have been originally clear, as that which remained in the ventricles and spinal canal was so. Some congestion of parietal arachnoid, and of pia mater. The *cerebellum* was soft in consistence, with arbor vitæ well defined; slightly congested. The *cerebrum* more vascular and rather softer than usual. Corpus callosum, fornix, and crura cerebri slightly softened; the latter were torn in being removed. Olfactory bulbs much softened so as to present a ragged appearance. Some fluid in the lateral ventricles—no third ventricle; the choroid plexus congested and presenting numerous pouches filled with serum. The surface of the lateral ventricles seemed as though somewhat softened by soaking in the serous fluid. In laying open the spinal cavity diminished mobility was noticed between the 3d and 4th and the 5th and 6th cervical vertebræ. The medulla spinalis was surrounded with a considerable amount of clear serous fluid, and congested vessels were noticed on its surface. It was laid aside, as were the corpora striata and thalami, portions of the cerebrum, the cerebellum, pons Varolii, and medulla oblongata, for microscopic investigation.

Examination of the abdomen.—On making an incision through the walls of the abdomen (the body having been replaced on the back) the

sigmoid flexure of the colon was seen very much distended with extremely offensive flatus; it rose nearly to the epigastrium, was highly congested and inflamed, in some parts almost grayish, and contained besides the flatus dark grumous bloody fluid, and a layer of coagulated blood on the mucous surface. The large and small intestines and mesentery were thickly strewn with subperitoneal tubercles of the yellow caseous form. The gall-bladder was filled with gall-stones and pus—the latter derived by a fistulous sinus from an ancient abscess probably tuberculous with firm walls and somewhat caseous contents situated in the liver. The surface of the latter presented a pit-like depression on its antero-superior surface a little to the right of the notch. The liver was softened and friable: the ramifications of capsule of Glisson well-marked. The kidneys were mottled, congested, and softened. Supra-renal capsules healthy. Atheroma of bifurcation of aorta. A good deal of serum in pericardium. The heart was much softened and degenerated—no valvular disease.

Thorax.—The left lung was adherent at base and posteriorly at the upper part. Tubercles in process of softening were found in abundance at the apices of both lungs.

Skeleton.—The whole spinal column was much softened—so that a scalpel would readily cut the bodies of the vertebræ. A piece was thus cut out of one of the lumbar vertebræ. The same condition was found in the trochanter, patella, head of the tibia, and in the tarsal bones. At the lower extremity of the sacrum was found a spinous process, apparently that of the last sacral vertebra, projecting backwards within a quarter of an inch of the skin.

Microscopical Examination.—Dr. S. WEIR MITCHELL writes as follows:—

“The portions of the nervous system submitted to me for examination were parts of both cerebral hemispheres, anterior half of cerebellum, the crura cerebri, corpus striatum, optic tubercles, and the pons. Also the medulla oblongata and the entire spinal cord, with a piece of the left brachial nerve. These specimens were in good order—had been removed two days after death—the body having been kept in ice.

The parts above named, with the exception of the spinal cord and oblong medulla, were found to be free from any very notable alteration, excepting that throughout, their bloodvessels were slightly but very uniformly affected with oleaginous degeneration. There were no evidences of pathological softening.

At the upper part of the posterior face of the medulla oblongata, in the mouth of the fourth ventricle was a small, rough concretion measuring two lines in diameter. It was irregularly rounded, and lay between the restiform bodies and posterior pyramids, where they divide to pass into the walls of the ventricle. This foreign body was imbedded in the membranes, and made such pressure on the dividing strands as distinctly to alter their form. This was best marked on the left side. No pressure was made by the mass upon the floor of the ventricle, nor were there at any of these points the least signs of inflammation.

I failed to discover any lesion in the medulla oblongata, but the cervical and dorsal regions of the spinal cord were extensively affected. When fresh, this disease presented a series of gray, translucent spots of irregular form, and, sometimes, almost perfectly transparent—a gelatinous alteration, atrophic in character, since the spots in question were always somewhat hollowed out so as to lie below the common level of the cord and to indicate loss of substance.

The microscopic examination of these parts, which lay chiefly in the white portions of the cord, showed: 1st, total absence of normal nerve tubes and nerve cells; 2d, finely granular matter, molecules, and small globules of fat in great quantity; 3d, no granulation corpuscles; and 4th, numerous fibres which may have been degenerated nerve tubules (atrophic alteration) or connective tissue fibres, such as are found in spinal tissues.

The vessels of the cord were everywhere altered by fatty deposits, which, if I mistake not, were singularly conspicuous in the near neighbourhood of the atrophied parts. I was unable to detect a single vessel within the tissue so altered. Elsewhere, as I have said, the state of the vessels was remarkable, many of them being hidden from view by dense masses of fat molecules, through which they passed, the oil being not only deposited in their walls, but grouped in masses about their tracks.

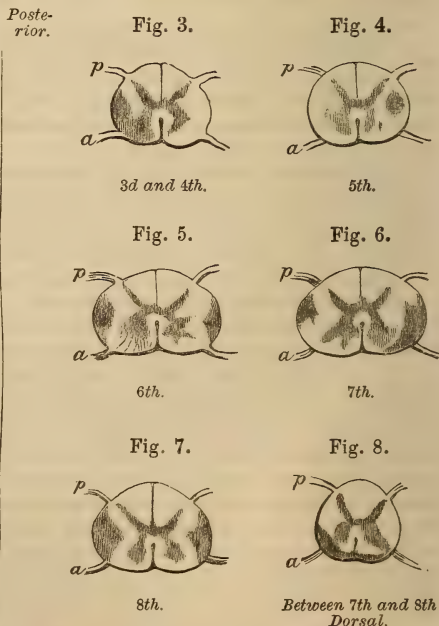
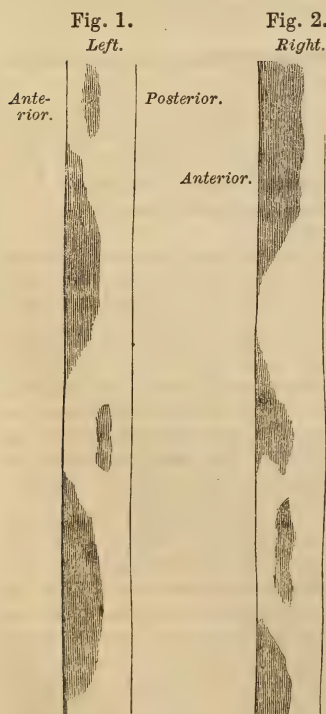
The exact situation of the gray gelatinization of the cord was studied with the most minute care. Excepting in a small spot which invaded the right posterior horn of gray matter at the level of the first cervical nerve, and a like spot on the left side in the same situation, the change respected the posterior horns and columns of the cord. In the two localities above described the microscopic changes were the same as elsewhere.

The lateral columns were extensively diseased, the spots, as a rule, lying between the anterior nerve roots and the central line of the lateral columns, affecting, therefore, most largely, the parts nearest the anterior nerve roots. (See Figs. 1 and 2.)

In three places the changes passed across the anterior columns. From the seventh dorsal to the eighth dorsal nerve a large spot extended across both the anterior columns. Its depth and form are indicated in Fig. 8. About the level of the tenth dorsal and at the second lumbar nerves two spots were found crossing on to the right and left anterior columns respectively, but not involving the whole width of either. Below these points I found no patches in any part of the cord.

The most extensive lesions were in the lateral columns of the cervical cord. Their surface extent is shown in the accompanying diagrams, Figs. 1 and 2.

Their depth and the parts internally affected may be seen from Figs. 3, 4, 5, 6, and 7, better than from any descriptions.



The right and left lateral surface view of the lesions of the cervical cord.

Lesions in the cervical region at the level of the nerve roots, indicated by the numbers.

In the dorsal region the spots were abundant but less numerous than above, about half as many for equal areas of tissue. In many portions both of the cervical and dorsal regions the atrophy involved the point of entry of the anterior nerve roots and the gray matter of the anterior horns, as may be seen in Figs. 6, 7, and 8.

The central canal of the cord was distinct throughout, a condition usually lost during childhood.

The portion of the brachial nerve examined was in a state of remarkable integrity and presented very few atrophied fibres.

As the reports of this case state, there were the following symptoms to be explained by the condition of the nervous system:—

1. Integrity of mental and moral manifestations.
2. Absolute loss of voluntary motor power below the head, or rather below the neck.
3. Sensation, nearly perfect.
4. Respiration, good; reflex motion preserved and exhibited in the form of spasm on irritation of certain parts of the skin.

I should have thought it unlikely that there could be perfect mental power with so general an affection of the vessels of the brain; such, however, was the case, and it is interesting to observe that there was certainly no morbid softening.

The loss of volitional control is easily accounted for by the amount of disease present in the anterior columns and cornua, and in the *general* alteration of the anterior part of the lateral columns of the tissues immediately in the tracks of the emergent anterior nerve roots.

Sensation was entire, because only in one point were the posterior horns and columns at all injured. Even at this place the lesion was not more than three lines long on the left side, and was not a perfect atrophy on the other, so that it was insufficient to affect conspicuously the function of general feeling."

The phenomena presented above may be classified under three heads, viz: 1. The alterations in the nerve centres; 2. Alterations in the nutrition of the various other organs; and 3. The immediate cause of death.

1. The condition of the encephalon may be considered as nearly normal, except the presence of an excessive quantity of serous fluid, the fatty accumulations around the smaller bloodvessels, the concretion in the mouth of the fourth ventricle, the absence of the third ventricle, and the slight softening probably due to the general lowering of the nutritive functions throughout the body. In connection with the clearness of intellect manifested throughout his disease of twenty-four years' duration and up almost to the last moment of life, notwithstanding the probable existence of a large quantity of serum in the ventricles and arachnoid cavity, our attention may well be drawn to the cases described by Mr. Hilton, in his papers "On Disease and Mechanical Rest," published in the *Lancet*. The probable want of any communication between the lateral and fourth ventricles would then account for no difference being observable in the amount of paralysis in the erect or prone position. Dr. Price's statement that no sugar was to be detected in the urine is interesting in connection with the existence of the calcareous mass in the fourth ventricle.

As regards the condition of the spinal cord, nothing can be more striking than the confirmation it gives of the views of Brown-Séquard as to the mode of transmission of voluntary motor power through the antero-lateral and anterior columns. If we suppose that the long-continued over-exertion of his physical powers had caused a destruction or atrophy of a portion of the motor cells of the anterior cornua, followed by atrophic retrogressive gelatiniform degeneration of the nerve tubules proceeding from these cells, and that this process was repeated as the remaining cells were brought into excessive action to maintain the func-

tions of life, a result more closely resembling that observed in this case would be obtained than that from any other hypothesis I can form.

A most noticeable feature in the case is the absence of ordinary white or red softening.

2. The processes of nutrition in the osseous, muscular, and visceral organs were evidently enfeebled, though there was no wasting. But the softening of the bones and their congested appearance, the fatty degeneration of the heart, liver, and kidneys (though apparently recent, at least not far advanced), and the tubercles disseminated over the sub-peritoneal surface of the bowels and in the lungs, all point to a lowering of the organizing power of the system—a failure of vital force. In this connection it may be remarked that Dr. Pennock had confined himself to an almost exclusively vegetable diet for some years, under the idea that, as he could take no exercise, he ought to avoid animal food. No tubercular predisposition exists in his family: many of them have suffered from gout: an aunt was afflicted for many years with a somewhat similar paralytic affection, and another member of the family had an arrested development of one leg—probably of nervous origin.

3. There can be no doubt that the intensely inflamed, semi-gangrenous condition of the lower bowel was the immediate cause of death. His system, in its enfeebled condition, not being able to sustain the process of inflammation, succumbed readily to a cause originally slight, such as the then prevailing epidemic of influenza.

1868. Feb. 5th. *Report on Epidemics and Meteorology.*—Dr. WILLIAM L. WELLS, by appointment, presented the following report:—

The meteorological observations upon which my remarks in the present report are based, were taken by Prof. J. A. Kirkpatrick, A. M., of the Central High School, and may be found published in full in the journal of the Franklin Institute, of this city.

The year 1866 had been remarkable for extremes of temperature both of heat and of cold. The thermometer reached a higher point in summer, and a lower one in winter, than at any time for at least fifteen years. The year 1867, on the other hand, while the thermometer had a less range by 26° than the preceding year (91° Fahr. being the highest, and 8° the lowest temperature), was characterized by *barometric* extremes greater than at any time for at least sixteen years. The mean daily range of the barometer was also remarkably great, being 0.187, to 0.157, the mean of sixteen years; and this was not caused only by the excessive variations in one or two months, but was the case in every season of the year.

The mean temperature of the year was $53^{\circ}.41$, or more than a degree less than the average, which is $54^{\circ}.36$.

The mean of the barometer was 29.978, while the average height for sixteen years was only 29.866.

62.935 inches of rain and melted snow fell in 1867; 16 inches more than the average fall, 46.926.

The lowest point at which the barometer stood during the year was 28.778 on the 8th of May. It reached its highest point on the 11th of February, when it stood at 30.970; after which there was a long continuance of rainy weather, although the rain was not sufficient to cause floods. The rain in February was 4.82 inches, the average being 3.277; and in March it was 5.67, the average being 3.419 inches.

The mean temperature of March, $37^{\circ}.58$ Fahr., was very much below

the average— $40^{\circ}.90$, chiefly owing to a period of steady continuance of cold from the 15th to the 20th. There was a deep snow on the 16th and 17th.

There was a great freshet in the Delaware and Schuylkill on the 8th of May, and another freshet in the Schuylkill, which did a great deal of damage, on June 17; but August was most remarkable for excessive rain, as 16.84 inches fell, 4.52 inches being the average for seventeen years. On one day alone, the 15th of August, 7 inches fell, or three times as much as fell in the whole month in 1866; and the water the next day rose to nine feet on the dam at Fairmount.

In the three summer months nearly 31 inches of rain fell, $2\frac{1}{2}$ times the average, although in July there was a little less than the average.

There was a severe hail-storm on September 25, which was very widely extended, for although there was only a rain-storm at the time six miles north of the central part of the city, yet hail fell in New York city, and up the North River, three hours before it began here.

The average temperature of summer was $74^{\circ}.05$ Fahr., more than $1\frac{1}{2}^{\circ}$ below that of 1866, $75^{\circ}.63$, and $1\frac{1}{3}^{\circ}$ below the average temperature of summer for sixteen years— $75^{\circ}.38$.

If we examine into the relation between the heat of the hottest month, July, in the past seven years, and the total mortality from diseases of the stomach and bowels in the same years, we find that in 1866, when there occurred the hottest July ($80^{\circ}.72$ being the mean for the month), there was also the greatest mortality from those causes—3634. 1865 was second in both respects, $78^{\circ}.29$ and 2570; 1863 and 1864 came third and fourth as respects the heat of July— $76^{\circ}.99$ and $77^{\circ}.61$; and fourth and third respectively as to the mortality, 2335 and 2413; while the three remaining years, 1861, 1862, and 1867, although when compared with each other they do not follow the rule, yet as compared with the other four they show the least heat ($76^{\circ}.10$, $75^{\circ}.60$, $76^{\circ}.09$), and also the least mortality (1803, 2280, and 2095). This relation holds good whether or not we include Asiatic cholera, and also whether or not we count marasmus among the other diseases of the stomach and bowels.

On examining the relation between the heat of the whole summer, or the whole year, and the same diseases, the correspondence does not appear to the same extent, even as regards the summer months, and, as regards the whole year, hardly or not at all.

Births.—The number of births registered at the office of the Board of Health during 1867 was 17,007, 330 more than in 1866. The excess of male births amounted to 787 or 9.7 per cent.

It has been found that the proportion of female conceptions is often increased at times of great depression, as for example from financial panic, epidemics, &c.,¹ and as cholera prevailed in Philadelphia from July to November, 1866, it is a matter of interest to determine whether the proportion of the sexes born nine months after that period would be changed.

The epidemic was slight, and consequently we could not expect to find any very marked change.

The excess of male births in April, nine months after July, when cholera began, was only 7.83 per cent., or decidedly below the average. The excess in the following month, nine months after that in which the

¹ See a paper published by Gouverneur Emerson, M. D., in the American Journal of the Medical Sciences for July, 1848.

epidemic was second in severity, was only 4.4 per cent., or less than in any other month except September, when there were only 3 more male than female births:—this being nine months after December, one of the healthiest months of the preceding year. In June the excess of male births was 17 per cent. or more than in any other month, and in July, nine months after the period of greatest severity of cholera, it was just below the average, or 9.5 per cent.

We thus find here a slight change, corresponding with what we might expect from the depressing influence of cholera, but at the same time we see the influence of some other undetermined cause.

Deaths.—In 1867 there were reported in Philadelphia, at the Board of Health Office, 13,933 deaths—1 death in 54, or 1.85 per cent. of the total population, taking it at 750,000, which is believed to be very near the reality. This is a diminution of 2870 from the deaths reported in 1866, when cholera prevailed; and as that disease caused in that year only 910 deaths, it shows a positive diminution of nearly 2000 independently of that. The contrast with 1865 and 1864, when there was no great epidemic, is even more remarkable, as in the first-mentioned of those years there were 3236 more deaths; and in 1864, 3649 more deaths than in the year just past. In 1864 there were more deaths than ever before or since in this city. In no year since 1860 have there been so few deaths in Philadelphia as in 1867.

The deaths among males amounted to 7215; among females to 6718; and this excess of males, amounting to 497, was (except 38), entirely among minors, as 3914 males died under 20, and only 3482 females—while among adults there were respectively 3274 and 3236.

The number above given as the total includes the still-born—780, or 5.6 per cent. of the whole number, and those who died in the country and who were buried in the city, 493 in number. On deducting these we have remaining as the deaths in the city, 12,660—one in 59 of the total population, or 1.68 per cent. Of those born alive, more than one-fourth, or nearly 27 per cent., died before attaining the age of one year; and 11 per cent. of the remainder in the following year. At the age of 20, half of those born alive would be dead, judging from the rate of mortality in the past year, the period between 10 and 20 being by far the most healthy, as more than nine-tenths of those who live until 10, attain the age of 20. The risk of death in the following decade would be 22 in 100: 23 in 100 die from 30 to 40, and in the succeeding periods of ten years, 26.17, 32.57, 44.15, and 60.57 per cent. of those who in each instance attain to the beginning of the decade. This brings us to the age of 80, when we find that only 16.55 in 100 of those who reach that age live ten years longer.

On comparing the different periods of the year, we find that more deaths occurred in July than in any other month, the mortality being 1795, or 12.88 per cent. of the total mortality; while November was the healthiest month, only 871 dying—6.25 per cent. of the whole, or less than half of those who died in July. This contrast was especially caused by diseases of the stomach and bowels, and this above all among children, as three children died in July to one in November; and, under two years, nearly four to one. Among adults the greatest mortality was in January—749; and in August and September fewest died, viz., the same number, 449, in each month; while in June 464 died, or one less than in November, when the *total* mortality was least.

January was not only the month in which most adults died, but also (next to July and August) that in which most children died; and it was the month in which the total mortality stood second.

The diseases which more especially caused this excess in January, were, 1st, *phthisis pulmonalis*, which caused 224 deaths—11.5 per cent. of the total mortality from that disease, and more than twice as many as were caused by it in August, viz., 104; 2d, pneumonia, which caused 110 deaths, exceeding by 8 the whole number of deaths from that cause in the four months from June to September inclusive; and 3d, scarlet fever, which caused 79 deaths, or 17 more than in the last five months of the year put together. After January more adults died in May than in any other month; then in October, and then in July.

The total deaths from phthisis, which, as usual, was more fatal than any other disease, amounted to 1947—three more than in the preceding year; but, with that exception, less than in any year since 1861. As regards the sex of those who died, we find 942 males and 1005 females—the males being in excess in each of the first three months of the year, and the females in all the remaining months. The ratio of the deaths from this cause to the total deaths (excluding still-born) was 14.80 per cent., or 1 in 6.75.

More deaths took place between the ages of 20 and 30 than at any other decennial period, viz., 593; then between 30 and 40, 451; and after that, between 40 and 50, 297; between 10 and 20, 186; between 50 and 60, 170; and between 60 and 70, when 114 deaths took place; 91 died before the age of 10, and 45 over 70.

Next to phthisis, the diseases which were reported as causing the greatest mortality were—

	Deaths.
Cholera infantum, which caused	862
Pneumonia	695
Debility	648
Convulsions	584
Marasmus	549
Dropsy (counting all the varieties)	487
Old age	420
Inflammation of Brain	394
Disease of the heart	369
Scarlet and typhoid fevers, each	367
Congestion of brain	286
Inanition	252
Palsy	231
Disease of stomach and bowels	217 ¹

Cholera broke out October 18th, suddenly, in the United States frigate Potomac, the receiving-ship at the Navy Yard. Two men were attacked in the evening and both were dead before the sun rose next day. The ship was at the time, and had previously been kept, in a cleanly condition. On the following day three men were attacked, and on the 20th, eight. All the healthy men were then removed to two other vessels, and a fourth vessel sent for, which was used after the 23d as a hospital ship: but in spite of this, 14 new cases occurred on the 21st, and on the four succeeding days 6, 8, 6, and 2 respectively; after which time no new case of collapse occurred, and in a couple of weeks more the epidemic was at an end. No death took place after the 31st. There were in all 76 cases

¹ For full tables of mortality, see the Report of the Board of Health of the City and Port of Philadelphia for the year 1867.

and 30 deaths, out of a total of 502 men, who composed the officers and crew of the vessel at the time of the outbreak of the epidemic. Energetic measures were taken at the beginning and afterward to disinfect all the vessels.

The total mortality in the city in October from cholera was 35, 5 of whom died in the old district of Kensington, which is still supplied by the Delaware water, polluted as it is by the discharges from the sewers. Two cases of cholera originated in the County Prison, about the same time in October that the disease made its appearance at the Navy Yard, and both died.

Subsequently to October, 14 deaths were reported from cholera, 9 in November, and 5 in December; of these 1 occurred in the First Ward, in which the Navy Yard is situated, and 12 in that small part of the city supplied by the Delaware water, and in which, as mentioned in my last report, one third of the whole number of deaths from that cause in 1866 occurred, although it only contains one-seventh of the population of the city. This district is more than two miles distant from the Navy Yard.

Previous to October, in 1867, only 8 cases are reported in the lists of interments; of whom 3 died in the country, and were buried in Philadelphia, and of the remaining 5, 2 were in Kensington, and 1 (which occurred in July) was in the vicinity of the Navy Yard. There were no deaths from cholera between the months of July and October; and although every effort was made to discover whether the epidemic at the Navy Yard might not have originated by contagion, no way in which this could have occurred was discovered. The possibility was referred to, in the official report on the subject, of its having originated in consequence of the employment by the crew of Delaware water to a limited extent, although the pure Schuylkill water was that which was chiefly used.

On the 2d of November, an epidemic of cholera began at Lancaster, which was popularly ascribed to the employment in an iron foundry there of two men, who were said to have deserted from the Philadelphia Navy Yard. The first case was the foreman of those works. There were in all 12 deaths.

In Reading a slight epidemic was ascribed to a similar cause.

I have stated above that in October 30 deaths took place at the Navy Yard, 5 in Kensington, and 2 in the County Prison, and yet the records of the Board of Health show only 35 deaths for that month. This discrepancy may be accounted for by the fact that these Board of Health reports state the ward from which the body is buried, and not that in which the death took place, so that some of the Navy Yard cases may be reported at the Board of Health as in another ward; and also that the Board of Health reports the date of the interment and not that of the death, so that a Navy Yard case reported for October by the authorities there, may have appeared in the health reports for November.

The deaths from the various low and malignant forms of fever, including cerebro-spinal meningitis, typhoid, and typhus were greatest in the second quarter of the year, viz., 188, and least in the last, or 126. The total mortality in the year from these causes was 616, or a little more than in 1866, when there were only 574, but less than half the mortality in 1865, viz., 1321.

The total number of deaths from variola in 1867 was only 48 to 144 in the preceding year, and 524 in 1865. Of these 48 deaths, 22, or nearly half, occurred in the first two months of the year.

The epidemic of *diphtheria* also continues to wane. There were 119 deaths from this cause, to 192 in 1866, and 260 in 1865.

There were 83 deaths from *measles* to 221 in 1866, 54 in 1865, 90 in 1864, 82 in 1863, 109 in 1862, and 74 in 1861, showing a change in 1867 to about the usual mortality, from the year before when it was far more fatal than for many years, and the year before that, when the mortality was considerably below the average.

Of all the deaths reported from *cancer*—200 in number—not one was of a person under the age of 20. The greatest number—112—died between 40 and 60, and just as many in the first as in the second half of that period.

The deaths from *croup* were 185, decidedly fewer in number than had been the case for more than ten years. There were more females than males, contrary to the usual rule. In August there were only 3 deaths from croup, and in September 4. The highest number in any one month was in December—35, then in October—25; January, 22; and April, 21.

As was the case in phthisis, more males than females died in the first few months of the year, while the case was reversed afterward. 72 died between 2 and 5; 63 between 1 and 2, and 26 under 1 year.

The diseases which proved fatal to very young children more especially were—

1st. Cholera infantum, which caused 843 under 2; this including all who died of the disease except 19, and these were all under 5 years. 629 out of the 843 were under 1 year.

2d. Convulsions, which caused . . . 478 under 2 (404 of them under 1).

3d. Marasmus 474 “ 2 years.

4th. Debility 411 “ 2 “

5th. Pneumonia 254 “ 2 “

6th. Inflammation of brain 233 “ 2 “

7th. Inanition 199 “ 2 “ All but 7 under 1 year.

8th. Congestion of brain 120 “ 2 “ 93 of them “ 1 “

9th. Asphyxia 109 “ 2 “ All but 1 “ 1 “

10th. Dropsy of brain 104 “ 2 “

11th. Scarlatina 100 “ 2 “

12th. Diarrhœa 92 “ 2 “

13th. Croup 89 “ 2 “

14th. Inflammation of stomach and bowels 75 “ 2 “

15th. Unknown 63 “ 2 “

16th. Dysentery 60 “ 2 “

17th. Bronchitis 59 “ 2 “

18th. Congestion of lungs 58 “ 2 “ All but 10 under 1 year.

19th. Cyanosis 57 “ 2 “ “ 3 “ 1 “

Only 2 more died over 2.

20th. Phthisis 56 “ 2 “ 40 of them under 1 y'r.

21st. Pertussis 51 “ 2 “

22d. Diphtheria 49 “ 2 “ and in the following 3 years 43 more.

The diseases which more especially caused the excess of *male* mortality among children were—

	Boys.	Girls.
Inflammation of brain	194	153
Convulsions	309	244
Marasmus	291	230
Cholera infantum	450	412

In phthisis pulmonalis and scarlatina the proportion was reversed. In whooping-cough the numbers were about equal.

ART. XV.—*Summary of the Proceedings of the Pathological Society of Philadelphia.*

1867. Dec. 12. *Penetrating Wound of the Kidney, followed by Profuse Hemorrhage into Bladder; Death from Pleurisy.*—Dr. WM. PEPPER related the following case:—

Robert S., æt. 26, admitted to the Pennsylvania Hospital April 7, 1867. Had been stabbed in the back with a sharp-pointed, narrow-bladed knife, which had entered in the upper part of the left lumbar region, and penetrated to a considerable distance forwards and downwards. The first urine which he passed after the reception of the injury was very bloody; and this condition continued for some days, the blood-corpuscles being at first merely changed by maceration in urine, but soon becoming mixed with a number of blood-casts from the renal tubules. The amount of blood in the urine steadily diminished, the blood-casts being replaced by epithelial and granular casts. The urine, however, remained highly albuminous. About the tenth day after injury, symptoms of pleurisy of the left side set in, and considerable effusion took place. The constitutional symptoms became more and more grave, and death occurred twenty-three days after the reception of the injury.

Post-mortem examination.—In the left pleural cavity there was a large amount of purulent liquid, containing flocculi of yellowish lymph. The pleura much thickened, and several firm adhesions between under surface of lower lobe and the diaphragm. There was no evidence that the knife had entered the pleural sac. Right kidney quite healthy; left kidney abnormally adherent in its position, and, upon being removed, the capsule and surrounding connective tissue were found very much thickened and dense. This was due to the effusion of a large quantity of blood into the cellular tissue around the kidney, which had subsequently become firmly coagulated. On making a section through this capsule, several points were found where the clot had undergone softening, and formed small cavities containing a puriform fluid. After stripping the capsule from the kidney, an acute-angled linear cicatrix was noticed upon the posterior surface. The wound seemed to have quite healed externally, and upon cutting along the original track it was found to extend through the secreting structure of the kidney, and to terminate at one of the calyces. The line of the wound was marked by a yellow streak; but the tissue seemed very little degenerated in its neighbourhood. There were also two patches, about one-third of an inch in diameter, just beneath capsule in neighbourhood of the wound, where tissue was converted into a yellow fibroid structure much resembling the results occasionally following embolism. Ureter quite healthy; urinary bladder much distended, and, when incised, was found to contain a very large, firm, spherical clot, moulded to interior, and presenting at its centre a small cavity, containing turbid urine; this cavity communicated with urethra, and was evidently the channel of escape for the urine.

The progress of the case, especially the progressive improvement in the condition of the urine, and the post-mortem appearances of the kidney, alike lead to the belief that the wound of this organ had almost entirely healed, and that no very serious impairment of its secreting power would have followed. It appears probable, from the lesions in the left pleural cavity, that a subacute pleurisy had been excited at the time of the injury,

and that an acute exacerbation had occurred about ten days subsequently. This occurrence is the more to be regretted since the position of the wound, and the chemical and microscopical characters of the urine, so positively established the diagnosis, that, had recovery ensued, the fact might have been considered demonstrated that a penetrating wound of the kidney may occur without causing death, or establishing any chronic disease of the wounded viscus.

Dec. 26. Spinal Meningitis.—Dr. W. PEPPER, in presenting the specimen for Dr. J. S. BODINE, of Trenton, read the following history, drawn from the notes of Dr. B.: John A. L., æt. 24, came under observation November 2, 1867. In the winter of 1863–64, while in the army, he suffered from a severe and protracted attack of articular rheumatism, affecting the endocardium also; and in 1864–65 he had again a similar attack. After this he was removed from active duty until his discharge from the army, in June, 1865, when he returned to his occupation as a labourer, which he followed until a few days before his last illness. During this time he complained frequently of vague rheumatic pains, but was never prevented from working until October 20, when he had a fall from a wagon.

Nov. 2. Ten days after this he started for Trenton, and reached there the same day, and sought a night's lodging at the Almshouse. He was observed to stagger in his gait, and was supposed to be drunk. The following day he felt sick, and when seen at 3 P. M. had a hot skin, frequent pulse, and intense frontal headache; tongue slightly furred. His nose had bled two or three times during the day. Ordered a febrifuge and laxative.

4th. Has been somewhat delirious during the night, and still complains of violent frontal pain and general soreness; pulse 88. Remembers nothing of his past history, and can give no account even of how he reached Trenton.

5th. Fever and headache somewhat abated; mental condition remains the same, with muttering or noisy delirium. There is a slight tendency to retraction of head; tenderness on pressure over cervical vertebra, and marked general hyperæsthesia.

6th. Eyes suffused; internal strabismus most marked in the right side. Busy delirium, with marked muscular tremor.

8th. More quiet; strabismus marked; double vision, with hallucinations of sight, and still some muscular tremor.

10th. Intense headache again, with febrile excitement. Towards noon he became comatose; lost power of speaking and swallowing, and apparently had paralysis of left side of face and of right side of the body, with drawing of head to the right, and total insensibility of pupils to light.

12th. Able to move right arm with difficulty; feces and urine discharged involuntarily. Death took place November 13, less than two weeks after beginning of attack.

The treatment consisted of blisters to back of neck, and iodide of potassium in full doses, given in camphor water.

Post-mortem examination twenty-four hours after death.—Body much emaciated, and marks of numerous scarifications over spinal region. Lungs presented a few pleuritic adhesions, and hypostatic congestion of the lower lobes. Heart and pericardium healthy; abdominal viscera also healthy. *Head*—slight thickening of membranes over convexity of brain; abnormal amount of subarachnoid effusion. There was also an increased quantity of serum in the ventricles.

The following description has been made after the cord has been immersed in strong spirit for two months: The brain substance was somewhat injected; the membranes at the base of the brain were very positively thickened, and this alteration increased upon approaching the pons Varolii. Over the under surface of the pons and medulla the free surface of the membranes was shaggy and roughened; and on raising them they were found to be very abnormally adherent to the surface of the cord. This adhesion was due to delicate processes, probably containing vessels which entered the nervous substance in great numbers, so that when the membranes were removed the surface of the pons and medulla presented an unusually porous appearance. The attached surface of the membranes was also roughened. The thickness of the meninges varied from less than one line to more than two lines; this latter thickness being only noticed at a point corresponding to the sulcus between pons and medulla. The thickening of the meninges was entirely due to the development of dense fibrous tissue. At the upper part of the left anterior pyramid, just at its junction with the pons, and corresponding to the point of greatest thickening of the meninges, there was a small transverse elevation, one line in height and about three lines long. On section this seemed no more dense than surrounding nervous substance, but of rather darker colour.

The results of *microscopic* examination of this little projection were rather unsatisfactory, owing to the prolonged maceration of the specimen in spirit; these points were, however, quite clearly made out; the absence of any abnormal cellular elements, and increase in the connective and fibrous tissue, and the presence still of a considerable number of not much altered nerve-tubes. No other peculiarity of the nervous substance in any part of the cord was noticed.

The meninges remained somewhat thickened for a short distance below level of the medulla, but were probably not abnormal from the dorsal region downwards. It may be remarked that the immersion of the specimen in alcohol had rendered it difficult to form any positive opinion as to the duration of the lesion of the spinal meninges. The symptoms, however, as may be observed, and as Dr. Bodine very justly remarked at the time, so closely resembled those of so-called epidemic cerebro-spinal meningitis, as to forcibly suggest that this may have been a case of that nature. On the other hand, however, the firmness and advanced organization of the inflammatory exudation, and the numerous adhesions which had formed, appear to point to an attack of rheumatic meningitis at some previous period, and to render it likely that death resulted from a renewal of the morbid action.

1868. Jan. 9. *Primary Cancer of Fundus of Uterus; Death from repeated Hemorrhages.*—Dr. WILLIAM PEPPER, in exhibiting the specimen, narrated the following history of the case obtained from Dr. Getchell, under whose care the case occurred:—

The patient was a married woman, aged 35, and the mother of three children, the youngest being three years old. Since the birth of this child, she has had six severe floodings, which she regarded as miscarriages—the last about four months before her death. Dr. Getchell was called to her nearly two and a half months after this supposed miscarriage, and found her losing blood rapidly. The os uteri was quite healthy, the uterus movable and not very much enlarged. The bleeding was readily

checked by astringents, but recurred in a few days, when it was again arrested by the introduction of a sponge tent, and powerful astringents into the cavity of the uterus. Hemorrhage returned in less than a week, when Dr. W. Hunt saw her in consultation; ether was administered, the cervix dilated, and a mass detected the size of a large walnut, springing from upper segment of posterior wall; this was so soft that it readily broke down under manipulation, and was extracted piecemeal. Astringents were introduced, and no hemorrhage occurred for about a week, during which time the woman, who had become extremely anæmic and prostrated, rapidly improved. The appearance of the fragments removed, led to the hope that the mass had been the retained placenta of the ovum discharged three months previously; but when on the return of hemorrhage, a week after, the uterine cavity was again explored, and the growth under posterior wall found to be again appearing, the diagnosis of cancer was positively formed. From this time until the date of her death, January 8, copious and uncontrollable hemorrhages occurred at short intervals, and rapidly exhausted her.

Post-mortem examination by Drs. Getchell and Pepper.—Tissues blanched; a fair amount of fat, however, still preserved; abdomen alone examined; no lesion was found in any organ, excepting the uterus; the uterus was retroverted, but quite movable; no abnormal adhesions whatever; the peritoneal investment smooth and glistening; the body of the organ increased to about double the normal size, but exceedingly flaccid and relaxed. Upon cutting through the anterior wall, the uterine cavity was found enlarged, and the cervix and os were so much dilated that it was impossible from examining the mucous surface to detect the line of insertion of the vagina, the cervix being entirely obliterated. There was, however, no disease of the uterine walls, excepting at a point on the posterior wall about three-fourths of an inch from the fundus, where a mushroom-like growth with a broad sessile base projected into the cavity. This mass, which was the stump of the tumour removed, was not more than three-fourths of an inch in height, of a dirty gray colour, and lax, doughy consistence. On section, its tissue was of a soft, fleshy character, and of a delicate pinkish gray colour; toward its base it became blended with the tissue of the uterine wall. There was, however, no induration or thickening of the uterine tissue, even immediately beneath it. The mucous membrane of the uterus was much stained and discoloured, but not otherwise abnormal.

Microscopic examination showed the growth to be composed of very numerous small fusiform, nucleated cells, interspersed with which were many quite large, irregularly shaped cells with single large nuclei. These cells were for the most part round or oval, though some caudate ones were also seen. The tissue was evidently undergoing degeneration, as a good deal of free oil, many granule cells, and some plates of cholesterin were also present.

Twin Conception; Abortion of one Embryo at an early period with Retention of the Membranes until after normal labour at full term. Dr. GEO. PEPPER gave minute details of a case of this kind.

April 9. Ovariectomy; Bilocular Cyst. Operation, January 3, 1852; Successful.—Dr. J. E. MEARS exhibited the specimens for Dr. W. L. ATLEE, and read the following history of the case from which they were derived.

Jan. 5, 1851. Mrs. M. Q., aged 67½ years, consulted me in reference to an abdominal tumour. Menstruation commenced at the age of 16 years, and has always been regular. She married at the age of 23 years; has had seven children, the youngest being 24 years old. Labours, though severe, were never instrumental. Has never miscarried. Has always enjoyed good health, with the exception of an attack of typhoid fever when 40 years old, and which confined her to the house for three months. She recovered from this with an entire change in her menstrual habits, becoming irregular, and continuing so for two years, when it entirely left her, but was followed by leucorrhœa. She subsequently recovered a good share of health. Her ancestors were healthy, and lived to old age.

She began to enlarge about two and a half years since, the enlargement having been first observed by her daughter. It was first noticed in the centre of the abdomen, and gradually increased, varying, however, in the rapidity of its growth. For the last three months she has suffered great pain, extending from the umbilicus around the hips, resembling strong after-pains, with cramps in the groins, accompanied with great distress in the stomach and sides.

The patient is larger than a woman at full period of gestation. The enlargement embraces the whole abdominal region, and the shape is uniform, with the exception of a mamma-like protuberance at the umbilicus. Change of position does not change the contour of the abdomen. Over the whole region of the tumour, and in different positions of the body, percussion returns a dull sound. Fluctuation perceptible everywhere, and resembles that of a thick fluid. Over the left side fluctuation less distinct than elsewhere, while here is the greatest resistance to pressure. When patient is recumbent, at the most elevated part of the abdomen, in the umbilical region, can be seen a tumour, resembling the female breast, five or six inches in diameter, and superimposed upon the deeper seated large cyst. This small tumour is cystic, can be fluctuated, and slightly movable upon the other. Between the periphery of this tumour and the body of the larger cyst beneath there seems to be a thin fluid in the cavity of the peritoneum. The patient being much emaciated these evidences are very plain. Pelvis free from tumour; the uterus *in situ*, its os open to receive the finger, quite movable, and apparently attached to the tumour by a long pedicle. The sound enters only about one inch, and causes pain. Measures round the umbilicus 40 inches, from xyphoid cartilage to pubes 19 inches, between the superior spinous processes of the ilia in front 23 inches.

Bilocular ovarian cyst diagnosed.

17th. I was requested to see Mrs. Q. again, in consultation with Dr. William Gardener, who had been in attendance upon her for several days. She was now suffering great distress throughout the whole abdomen, and had been confined to bed for the last week. The size of the abdomen had increased, particularly the region of the umbilicus, which was exceedingly sensitive to the touch, and the subcutaneous cellular tissue over the small cyst was in a state of inflammation. As she was suffering intensely, and her strength failing rapidly, we thought it proper to relieve her for the time by tapping. Entering a large sized trocar two inches below the umbilicus in the linea alba, I first opened the small cyst and drew off twenty-four ounces of thick, opaque, reddish fluid, which coagulated strongly by heat. After this was emptied, while the canula was in place, I again introduced the trocar, and penetrated the septum into the cavity

of the large cyst, taking away twenty-two and a half pints of a much clearer fluid, of a yellowish-green colour, which also coagulated by heat. The emptying of these two cysts caused the walls of the abdomen to incurvate, and no smaller masses could be felt in any part of the cavity.

Nov. 29. Mrs. Q., having recovered rapidly after the tapping, passed through the summer pretty comfortably. To-day, however, I was sent for to relieve her of great suffering and distress, and which was accomplished to a slight degree by anodynes.

Dec. 9. The distress has become more and more urgent, and anodynes being of no avail, she desires the tumour to be removed. But in consequence of her great age I gave no countenance to so grave an operation. She urged it, and I at last consented, provided the operation met the approbation of Prof. W. R. Grant. This precaution was dictated by the fact that this was the oldest case on record, that the propriety of ovariectomy was still *sub judice*, and that all the leading members of the profession in Philadelphia were hostile to it.

10th. Prof. Grant saw the case with me. Abdomen exceedingly tense and full, and two cysts traceable as before, but larger, and a spot, sore on pressure, is complained of in the left groin. Pelvis empty, uterus in place, os patulous, but the cervix and body not easily recognizable. Sound enters about one inch, and causes great pain. At this interview all the dangers of the operation were fairly presented to the patient, and still she persisted in demanding it. We agreed, under the circumstances, that the patient was entitled to avail herself of the only chance of life, and that an operation was justifiable.

Soon after this, my brother, Dr. John L. Atlee, of Lancaster, saw the case with me, and coincided in opinion. It happened just at this time that her husband was stricken down with a severe attack of pneumonia, which terminated fatally in a few days after. This suspended all action in reference to Mrs. Q., aggravating all her symptoms, and inducing great mental distress.

January 1, 1852. Not being able to tolerate her sufferings longer, and the danger of delay becoming imminent, she decided to have the operation performed on Saturday, the 3d inst. Consequently I ordered her to take a dose of castor oil the same night, to eat no solid food afterwards, and to live exclusively on liquids, such as beef-tea or broths. Pulse 104.

3d. 11 o'clock A. M., the following gentlemen had assembled: Drs. Gardener, Grant, Henry H. Smith, William B. Page, and Green; and Messrs. Drysdale, Atlee, Varian, Reed, Morgan, Jackson, Gilbert, and Fenner, medical students. Temperature of room 80° to 84°. Pulse 110. The anæsthetic agent, composed of two parts of concentrated sulphuric ether and one part of chloroform, liquid measure, was given in charge of Prof. Smith, and when sensibility was destroyed I made an incision four or five inches long in the linea alba below the umbilicus, carrying the knife boldly through the walls of the abdomen down to the surface of the tumour. Upon opening the peritoneum some serum escaped, and the small cyst came immediately into view. Passing my index finger between it and the walls of the abdomen I at once encountered adhesions, which I rapidly broke up to the extent of several inches around the opening, as far as the finger could reach. I now punctured the small cyst with the large trocar, and after emptying it, carried the trocar through the septum into the large cyst and drew off a large quantity of fluid, but did not succeed in completely emptying it. On attempting now to draw the

flaccid tumour through the opening made, I found it impossible, and was compelled to enlarge the incision downwards to the extent of two inches more. After this I succeeded in dislodging the entire mass from the cavity of the abdomen. All the time I was endeavouring to accomplish this, and also after it was done, the walls of the abdomen were carefully compressed by the hands of assistants, so as to completely prevent the ingress of air to the peritoneal cavity. The pedicle was three or four inches wide, varying from one-quarter to one-half an. inch in thickness, filled with large engorged veins, and attached to the left side of the uterus. The Fallopian tube, which formed part of it, was severed in order that it might not be included in the ligature. A needle, armed with a double ligature, was now passed through the centre of the pedicle, and each half separately tied. The tumour was separated, the tied pedicle allowed to drop into the pelvis, the ends of the ligature kept out, parts carefully cleansed, and wound dressed with seven twisted sutures, the whole secured with the ordinary bandage, and cold water-dressings applied. Gave a small teaspoonful of elixir of opium.

The patient bore the operation well. There was not the least distress of the stomach and bowels. The pulse was pretty well sustained during the operation, occasionally flagging, and at one time the anæsthetic being given too freely some alarm was created, but cold water being dashed into the face, and the tongue drawn out, she soon revived. The pulse settled down to 96 before I left her.

The tumour consisted of two cysts, a large and small one, and embraced the left ovary. The uterus and right ovary were healthy.

3d. 5½ P. M. Patient very comfortable; pulse 90, full and soft; skin soft; tongue clean and moist.

4th. 9 A. M. Has passed a very comfortable night, better than for the last three weeks, having slept soundly most of the night. Respiration 16, full and regular; pulse 80 to 86, full and soft; catheterism 3x of healthy urine; skin warm and moist. All the symptoms highly favourable. 9½ P. M. Pulse 90 to 100; complains of pain in chest; some spasmodic action of diaphragm, and eructations of wind. Ordered a teaspoonful of elixir of opium. Considerable thirst.

5th. 9½ A. M. Doing well; pulse 98 to 103, full, soft, and regular; skin warm and moist; tongue furred and disposed to dryness; considerable thirst. Changed dressings to wound, which looks well. Abdomen perfectly flat as it was after the operation. 5 P. M. Continues comfortable; skin the same; respiration easy and natural; pulse accelerated, 115, but soft and full; complains of no pain; a little uneasiness in her bowels occasionally from flatus. Catheter, 3vij of amber-coloured urine.

6th. 9½ A. M. Complains of the bladder; drew off four or five ounces of phosphatic urine; pulse 96 to 98; changed dressings and lifted her to another bed. Improved her diet; everything quite favourable; flatus passes per anum. 6½ P. M. Still doing well; pulse 102 to 104, of good character; countenance cheerful; abdomen flat, soft, and free from soreness; changed her garments.

7th. 9½ A. M. Improving; pulse 88 to 100, full and soft; changed dressings and bed; allowed better food.

8th. 9½ A. M. Had a very comfortable night, and says she feels quite well; pulse 96 to 100; skin natural; tongue slightly furred but moist; thirst moderate. Passed urine without catheter, and flatus passes readily. Ordered a small dose of oil, which brought away a small feculent discharge.

9th. Removed three needles, wound healing nicely.

10th. Removed balance of needles (four). Wound healing and patient getting on admirably.

11th. Discharge along the track of ligatures quite free.

18th. Patient has steadily improved, and to day walked across the floor.

31st. Ligatures came away.

The patient recovered perfectly, becoming fat and hearty, and lived until April 2, 1868, being in her eighty-fifth year, and then dying from debility.

Autopsy, April 4, 1868, by Dr. J. E. Mears.—Present, Drs. Atlee and Gardener. Body somewhat emaciated; skin discoloured and shrivelled; abdomen slightly distended by fluid; lower extremities œdematous; surface of abdomen smooth and regular; cicatrix scarcely traceable. On close inspection it is discovered as a small line in the linea alba, three inches in length, extending from a point three-quarters of an inch below umbilicus to a point two and a half inches above pubes. Section of the abdominal walls was made so as to include the cicatrix; walls thin, but little adipose tissue. Reflecting the portion of abdominal walls including the cicatrix, the pedicle was found attached to its under surface. Pelvic cavity filled with serum. No adhesions or traces of inflammatory action could be found at any point. Visceral and parietal surfaces of peritoneum smooth and glistening. Position of intestines proper. Uterus small, occupying its normal position, and freely movable, the length of the pedicle (three inches), preventing traction. Right ovary healthy, firm and contracted. Uterine arteries have undergone calcareous degeneration; bladder in a state of chronic inflammation; walls thickened; other organs not examined.

Remarks.—This specimen presents features of interest, which are enhanced when considered in connection with that of similar character presented to the Society by Dr. W. W. Keen for Dr. Atlee, Nov. 14, 1867, an account of which appears in the Reports of the Society in the *American Journal of Medical Sciences* for April, 1868. Combined they exhibit the results of operative interference at periods of life widely separate. In the first case, the disease manifested itself at the early age of fifteen, and one year later the operation of ovariectomy was performed. Notwithstanding the existence of complications and unfavourable conditions, the patient made a rapid recovery, and lived six years after the operation, enduring the hardships incidental to the life of a public prostitute, yielding finally to an attack of typhus fever, combined with the influences of debauch and exposure. In the second case, we have the opportunity of observing the results of the operation in a patient sixty eight and a half years of age, who, at the time, was worn out by great physical suffering, to which was added great mental distress, induced by the sudden death of her husband. This patient recovered without an untoward symptom, and lived in the enjoyment of good health to the age of eighty-five years.

In the valuable table, prepared with great labour and care by Dr. Atlee in 1851, comprising "a synoptical history and analysis of two hundred and twenty-two cases," being at that time "all the known operations of ovariectomy from 1701 to 1851," we find that the oldest person subjected to operation was the first patient of Dr. Atlee, upon whom he operated in 1844, aged sixty-one years. The youngest subject was a patient of Mr. Cæsar Hawkins, in whose case the operation was performed in 1846, at the age of eighteen.

ART. XVI.—*Proceedings of the Clinico-Pathological Society of Washington, D. C.*

1866. June 9. *Case of Sudden Delivery while at Stool.*—Dr. H. A. ROBBINS reported the following example of this:—

Mrs. —, wife of a soldier, arrived at Armory Square Hospital, on the eve of the 1st of June, 1863, after travelling day and night from the northern part of the State of New York. During the night Mrs. — visited the water-closet, when the pangs of labour came upon her, and before she could arise from the position she was in, the whole contents of the uterus had disappeared through the opening in the seat. Upon our arrival at the place, we could distinctly hear the cries of an infant in the drum, five feet below the surface of the earth. In the course of a few minutes the child was extracted from its filthy surroundings, and, much to our astonishment, the placenta and cord were found attached to it. The infant was a well-developed male child, weighing eight pounds. The mother was a small woman, with rather an unnaturally large, rigid pelvis. The hemorrhage was easily checked by cold applications. Mrs. — had given birth to two children prior to the birth of the one just reported; she stated that she had but little pain, and the deliveries were soon over.

June 23. *Incised Wounds.*—The following cases were reported by Dr. S. J. TODD as evidence of the inefficacy of the persulphate of iron as a styptic in arterial hemorrhage:—

CASE I. On the afternoon of June 11, 1866, I was called to see Wm. O'B., æt. 15, apprenticed to a coachmaker, who had sat down upon a crescent-shaped knife—used in this business to trim leather—wounding himself in the gluteal region. The messenger informed me that the hemorrhage had been very profuse, but had been arrested. On examination I found the injured part bandaged with coarse canvas, smeared with varnish, the blood dripping underneath, instead of soaking through. This being removed showed the wound which was half an inch in length and about two inches deep, immediately behind the left hip-joint. As the hemorrhage, which was from the bottom of the wound, was not controlled by ice and exposure to the air, the wound was plugged with lint saturated with sol. ferri persulph., and a firm compress and roller applied. The boy was placed in a wagon and sent to his home, where I visited him two hours afterwards with Dr. N. S. Lincoln. The bleeding continued, welling up between the plug and the wound, and hoping to secure the cut vessel, the wound was enlarged. The hemorrhage seemed to come from one of the small arteries about the articulation of the hip-joint; but our efforts to ligate it were unsuccessful, owing to its having retracted beneath the muscles, and to the insufficient light. As the bleeding ceased by direct pressure on the head of the bone, the wound was again plugged with lint and the styptic and the pressure maintained by compresses and bandaging.

12th. 9 A. M. Bandage soiled and clotted from an oozing which had occurred two or three times during the night. Perfect quiet was enjoined and the dressing left undisturbed.

5 P. M. Hemorrhage had recurred several times during the day, but had ceased spontaneously.

13th. Bleeding continuing, it was decided in consultation to remove the

dressing and enlarge the wound again, when the hemorrhage was found as copious as at first. In our efforts to ligate the vessel it was torn and lacerated and the hemorrhage ceased; a small artery, probably the distal extremity of the one wounded, from which there was some bleeding, was tied. The wound was left open and healed rapidly, water-dressings only being used. There was no recurrence of the hemorrhage.

CASE II. On the 21st August, 1864, I was called to Daniel W., æt. 16, who, two days before, had trodden upon a broken bottle and wounded the vessels of the sole of the foot. The wound had been dressed, but hemorrhage having recurred several times, I was sent for. Removing the dressing, I attempted to tie the cut ends of the artery, but the vessel had retracted beneath the muscles and fasciæ and could not be reached. I plugged the wound with lint and the persulphate of iron, and applied compresses and a roller. I was called twice the same day to arrest the bleeding, and, at the last visit, determined to ligate the posterior tibial, as the hemorrhage was from the plantar arch, and to apply a compress over the anterior tibial to prevent bleeding from the distal extremity of the cut vessel. This was done, and there was no recurrence of the hemorrhage.

CASE III. In September, 1864, I was called by a porter in a wine store who had cut the superficial palmar arch while bottling wine. As in the preceding case the artery had retracted and the wound was dressed with lint and the persulphate of iron and firmly bandaged, but with the same result as in the two cases just reported. In two hours I was again called, and took with me a medical friend who failed, as I had, to ligate the arteries in situ. We then cut down upon and tied the ulnar and placed a compress over the radial which entirely arrested the hemorrhage. Both wounds healed rapidly, and there was no recurrence of the bleeding.

October 6. *Case of Hydatids in Utero.*—Dr. C. M. FORD reported the following case:—

Mrs. S., mulatto, æt. 42 years, weight 200 pounds; plethoric; mother of thirteen children, of which nine are living. Menstruated regularly until November 1st, 1864, when suppression of the catamenia took place followed by enlargement of the breasts, morning sickness, and the accompanying signs of pregnancy.

February 1, 1865. Was called to see her, when she presented the following symptoms: Complained of constant nausea, faintness, and great exhaustion; sense of weight across the chest; palpitation of the heart; and dragging pains in the back, extending down the thighs. Pulse 100, weak and wiry; loss of appetite; tongue pale, but clean. Above the pubis could be felt a circumscribed swelling of the size of a pregnant uterus at about the term of five months. On making a vaginal examination, the os uteri was found to be slightly patulous, sufficiently so to admit of the index finger—both lips being indurated with a cartilaginous feel. Had been confined to her bed for the two weeks previous, suffering during that time from three discharges of bloody serum, and on the morning of my visit had a profuse discharge of the same character as the previous ones, except that it was but slightly tinged with blood. Ordered perfect rest, cooling drinks, light covering, and attention to diet; also, R.—Acid. sulph. dil. gtt. xx, every three hours; and, to relieve the excessive nausea, R.—Cerii oxal. gr. iij, morning and evening.

15th. Did well under treatment up to this date, when a profuse dis-

charge of markedly bloody serum took place, with an aggravation of the previous symptoms. Made a vaginal examination, but found no change in the os uteri.

16th. On consulting with Dr. Thos. Miller, a sponge-tent was introduced into the os uteri, and she was ordered R.—Liq. ergotæ fort. ʒj, every four hours.

17th. Tent in vagina, but os as before its application. The discharge being but slight, and the patient much prostrated, the use of the ergot was stopped, and milk punch, with a generous diet, ordered. The patient improved under this regimen until

March 3. When I was called in the night to arrest a decided attack of *flooding*; and during the attack she passed about a quart of hydatids; the os had become more patulous, and I could feel a mass of hydatids within the uterine cavity, but all efforts to remove them were unavailing. Again prescribed liq. ergot. fort. ʒj, every three hours.

5th. Passed three pints more of the hydatids, and the uterus could be felt through the abdominal walls to be about the ordinary size of a uterus after delivery. She continued to improve from this time until

19th. When, as she expressed it, she passed "a mass of flesh about as large as an orange covered with little bags of water." After which all the symptoms subsided and convalescence took place rapidly.¹

Nov. 3. *Vesical Calculus, with Renal Abscess and Calculus.* Dr. H. P. MIDDLETON read the following report:—

HENRY O'B., brought to the Episcopal Hospital, Philadelphia, on April 10, 1864, by Dr. Forbes, one of the visiting surgical staff of the Institution. Through the Dr. I obtained the following points in the history of the patient: He is 14 years of age; enjoyed uninterrupted good health until eighteen months ago; since then has suffered a good deal, presenting all the usual symptoms of stone in the bladder—frequent micturition; soreness in the region of the bladder; pain, more or less constant, at the head of the penis; retraction of the testicle; sediment in the urine, etc. About three months ago had a violent chill, followed by considerable febrile excitement and intense lancinating pain through the region of the kidneys. Pain and fever, though somewhat modified, lasted for several days, during which time he was treated with hop fomentations over seat of pain, and the internal administration of anodynes and diaphoretics. One morning, towards the termination of this attack, he was seized with violent dysuria, and upon examination of the fluid he had passed, it was found to contain considerable pus. Dr. Forbes then obtained the privilege of examining the boy with a sound. The examination, made the next day, readily established the diagnosis of a calculus in the bladder. The operation of lithotomy was then proposed, and urged upon the guardian of the boy, an aunt, who, however, would not listen to this proposition, being firmly convinced that the stone could be dissolved by the administration of medicaments. The case then passed from under Dr. Forbes' supervision, and he heard nothing more of the patient until about one week ago. Since Dr. F. last saw him

¹ (April, 1868.) Dr. Ford has since attended this patient in two confinements—the first on April 2d, 1866, when she was delivered, at full term, of a still-born male child, which had been dead two weeks with no assignable cause—the second confinement took place on July 19th, 1867, resulting in the birth, at full term, of a healthy female child.

(three months ago), he has been suffering with almost constant pain over the kidneys, extending down in the course of the ureters. Pressure in the lumbar region occasions great pain, which seems most intense on the right side. The patient is much emaciated; suffers with fever, colliquative night-sweating, and other symptoms of hectic fever. Lungs appear perfectly healthy under percussion and auscultation. His guardian now wishes to have the operation performed. Ordered the patient to have full generous diet; hop fomentations to be applied to the seat of pain.

April 14. Patient quiet and contented; thinks he is greatly improved. A consultation of the visiting surgeons was held. The boy was thoroughly examined, and it was determined to perform the operation to-morrow. Since the boy has been in the hospital I have daily examined his urine, both by chemical tests and under the microscope, and find it to contain the same ingredients, with but little variation in proportion. It is strongly alkaline, and contains some albumen, a considerable number of pus corpuscles, and a sediment consisting of the triple phosphates.

15th. The operation was performed to-day, in presence of the surgical staff, Drs. Lewis, Cheston, and Middleton. Dr. Lewis administered the anæsthetic (chloroform and ether). Dr. Forbes then performed, in the usual manner, the operation of lateral lithotomy. The stone was readily grasped by the forceps, and extracted without any difficulty. Its size was about that of a small hen's egg; weight, a little over 3vij. The patient rapidly recovered from the effects of the anæsthetic, feeling no discomfort afterwards. He was placed in bed, and cold water-dressing applied to the wound. He took some 3iij of milk-punch, and soon fell into a sleep which lasted three or four hours. 6 P. M. Took a cup of strong beef-tea. 8 P. M. Ordered f3ij liq. morph. sulph.

16th. Patient had a tolerably good night, but continues to sweat profusely. Ordered acid. sulph. arom. in inf. pruni virg. cort.; milk-punch and beef-tea *ad libitum*; hop fomentations to the back; morphia administered at night.

17th. Wound looking clean and healthy; patient seems to be improving in every way; has not complained of pain in his back for twenty-four hours. Treatment continued, with exception of opiate at night.

18th. No change.

19th. 6 A. M. The patient had a violent chill about 3 or 4 A. M., succeeded by intense febrile excitement; lips of wound much swollen, surrounded by the unmistakable blush of erysipelas. Ordered the cold water-dressings to be removed, and warm ones applied. Pulse 120, hard and wiry; skin frequently hot; tongue coated with a dense white fur. His bowels have not been moved for two days; ordered hydrarg. chlor. mit. and pulv. Doveri, aa gr. v. 2 P. M. Erysipelas rapidly extending; patient complains of pain under pressure in left iliac region; ordered the abdomen to be gently rubbed with warm olive oil and tinct. opii in equal proportions. 6 P. M. Peritonitis has evidently been established; pulse 140; has had a slight movement of bowels; ordered a warm mucilaginous injection, which brought away a large amount of fecal matter—some scybala. There is some tympanitis; patient with his legs and thighs flexed. 11 P. M. No material change, except a little delirium. Ordered hot applications to feet.

20th. 6 A. M. Patient has been very restless all night, and refuses to

swallow anything. Ordered enemata of beef-tea. 6 P. M. Patient is worse; seems very weak, and the delirium is now of the low muttering type. Midnight. The erysipelas seems to be fading, but the patient is evidently sinking. From this time he rapidly grew weaker, and died on the 21st at 5 A. M., ten days after the operation.

A *post-mortem* examination was made at 11 A. M. The abdomen was opened, when the whole peritoneal surface was found to be highly inflamed. The bowels were distended with gas. The bladder was opened; its coats were greatly thickened, though this hypertrophy was by no means uniform. The kidneys were then examined. The right one was first removed, and was found to be very soft, and felt as if distended with fluid. In detaching it from the ureter a quantity of pus escaped. The kidney was opened longitudinally, and a collection of pus was thereby revealed. Nearly, if not all the secreting substance, had been destroyed, and the cortical portion much thinned. This condition of things led to an exploration of the ureter, and a renal calculus, about as large as a half almond, was found about three or four inches from where the ureter had been attached to the kidney. The left kidney was next removed and opened in the same way, but nothing abnormal was discovered, save that the whole organ was hypertrophied to some extent, and there was, perhaps, a little congestion.

November 10. Acute Idiopathic Inflammation of the Fibrous Capsule of the Eyeball.—Dr. D. W. PRENTISS read the following case:—

Lucy S. (col.), aged about 25 years; of good constitution; servant; doing general house-work, including washing and ironing. The affection commenced Tuesday evening, August 21, with a chill, followed by high fever, which lasted during the whole night, but was not succeeded by perspiration. The next day, pain in the right eyeball was first observed; lancinating in character, but not sufficiently severe to prevent the patient from attending to her regular work. This pain continued to increase until the 23d August, when it had become very severe, and I was consulted. On examining the affected eye, a puffiness of the upper eyelid with thickening was observed, so that the lid could not be raised by the action of the muscles alone; the conjunctiva of both lids and eyeball was apparently healthy; the eyeball itself was tender on pressure. Both eyes were remarkably prominent—which was especially noticeable in the affected one, on account of the œdema of the lid. The patient thought she had caught cold, the Monday previous, from having been over the wash-tub the whole day and getting overheated. Not being able to satisfy myself as to the diagnosis, I ordered merely a topical application of the solution of acetate of lead and opium, and a full opiate at bedtime. The following day did not see the patient, and, on the 25th August, was informed by her mistress that she was at home too sick to attend to work. I called and found her suffering intensely from pain in the eye, feeling, as she expressed it, “as though the eyeball would burst out of her head.” The eyeball was protruded outwards and downwards rather more than one-fourth of an inch beyond its fellow; the œdema of the upper lid had become general—extending to the conjunctiva—and now amounted to chemosis; voluntary motion of the upper lid was lost; the eyeball was fixed in its position, and, on account of the protrusion a portion of the cornea was left exposed, the lids not meeting over it. The

whole appearance of the patient was one of hideous suffering. A saline purge was ordered; morphia to allay pain, and blister behind ear.

August 26. Condition of eye worse; protrusion of the ball increased; chemosed conjunctiva congested and inflamed, especially that portion covering the exposed cornea, where it was elevated into a ridge. The sight, which yesterday was scarcely affected, has to-day become dim and confused. Saline purgative and morphia continued.

27th. Dr. Drinkard saw the patient in consultation. The eyeball was now protruded fully half an inch beyond that of the opposite side; all the symptoms aggravated; pain intense, shooting through to back of the head; considerable inflammatory fever, but not so great as was expected. The chemosed ridge across the cornea was scarified, allowing a quantity of serum and blood to escape, but no pus. Treatment continued—sulphate of magnesia being given in drachm doses repeated every two hours, and sweet spt. nitre added to morphia.

28th. Patient still worse in every respect. The inner portion of the upper eyelid has become tumid and congested, with a discoloured spot in its centre, having a doughy feel, and exactly the appearance of the skin when an abscess is approaching the surface. Phlegmon of the orbit with abscess was diagnosed, and the necessity of immediate operation recognized. Dr. Lincoln was called in, and coincided with us in opinion. Chloroform was then administered, and a sharp-pointed straight bistoury was passed through the upper lid at the discoloured spot, back into the orbit, keeping close to the superior orbital plate; but no pus followed the incision. The space behind the eye was then carefully examined by the probe, and another incision made nearer the internal canthus; but still no abscess was found. The tissues were much indurated, and the operation produced considerable discharge of serum and blood. Emollient poultices were now applied, and an increased dose of morphia ordered to be taken as soon as the effect of the anæsthetic passed off.

29th. Exophthalmos about the same; pain much relieved; the discharge of bloody serum still continuing from the incisions. A commencing point of ulceration noticed on the lower side of the cornea, evidently caused by the pressure of the swollen and inflamed conjunctiva, which latter was again scarified. Sulphate of magnesia discontinued, and citrate of quinia and iron ordered.

30th. Eyeball not so prominent—the pressure from within being evidently much lessened. Ulceration of the cornea has however increased. General condition of the patient improved; pain occurring only in paroxysms, and less severe. Tongue and pulse natural. From this time forward the patient steadily convalesced, except the ulcer of the cornea which attained the size of a split pea, when adhesive inflammation arrested its progress, and absorption began. In consequence of the closure of the incisions made in the upper eyelid during the operation, a small abscess formed at that point, which was opened.

September 3. Attendance was discontinued.

15th. The eye still a little prominent, with an opalescent spot in position of the ulcer. Vision entirely lost; cannot distinguish light from darkness. The treatment during the interval was changed according to circumstances—an astringent wash taking the place of the poultice when fomentation was no longer indicated.

October 22. Again saw Lucy. Her general health excellent; eye

apparently well, with a little convergence outwards and opalescence of cornea still observable. Blindness total.

November 9. Dr. Drinkard very kindly saw the patient, and made an ophthalmoscopic examination of both eyes. The left, which had not been inflamed, was normal. The right eye was difficult to examine, on account of the haziness of the cornea resulting from the ulcer. However, the capillary vessels of the optic papilla were noticed to have almost entirely disappeared, leaving it nearly white. This, together with the fact that the papilla itself, instead of being round, decidedly approached the oval form, indicated atrophy. One or two minute deposits of pigment were observed upon the anterior capsule of the lens, indicating the previous existence of slight iritis. No opacity of the lens, nor trouble in the humours of the eye visible. Vision entirely gone.

The above case may be stated to be an example of an intense inflammation of the fibrous capsule of the eyeball (*Tunica vaginalis oculi*) of rheumatic character, attended by extensive serous effusion, and possessing no tendency to suppuration and abscess. A minute description of this capsule will be found in *Lawrence's Treatise on the Diseases of the Eye*, edited by Isaac Hays, M. D. (Philadelphia, 1854), pp. 97-98; and in the same work will be found (pp. 859-865) a full account of the rheumatic inflammation of that tunic. Attention was first drawn to this affection by Mr. Ferrall, of Dublin, who reported two cases, which are related in the work just referred to, with some other cases of the same nature. Ferrall's cases will also be found in the number of this *Journal* for July, 1842, p. 197. The recent investigations relative to the minute anatomy of the capsule of Tenon, by Dr. Liebereich, are detailed in the number of this *Journal* for July, 1867, p. 241.

REVIEWS.

ART. XVII.—*A Practical Treatise on the Diseases of Women.* By T. GAILLARD THOMAS, M. D., Professor of Obstetrics and the Diseases of Women and Children in the College of Physicians and Surgeons; Physician to Bellevue Hospital, etc. 8vo. pp. 625. Philadelphia: Henry C. Lea. 1868.

THE proportion of men to women condemned to capital punishment is, Voltaire¹ asserts, not less than fifty to one. But though in virtue of her peculiar physical organization, her social position and duties, and her psychical nature, she is so much less liable to the commission of crimes punishable by death, she has, in virtue of that same organization, the peculiar functions of her economy, and certain social habits and customs, been made subject to very many physical sufferings and diseases from which her robust companion is exempt. Every general practitioner must have observed that not only among his adult patients the number of females preponderates, but, though not quite "fifty to one," this preponderance is very great; besides, we have our special hospitals and special practitioners; the number of each is probably destined greatly to increase, for diseases peculiar, not to men, but to women.

It is not strange, then, that works upon these diseases should in recent years be so multiplied, since means of investigation that were either entirely unknown, or known to only a few, or but partially developed, have now been perfected, thanks to the labours of such men as Récamier, Simpson, and Sims. And it is well for those who have the ability, the desire, and the opportunity of studying such maladies, to give the ripened fruit of their toil to a profession eager to receive it. This eager desire is not the simple thirst for knowledge, nor the mere prompting of general philanthropy, of which medicine in its best estate is one of the highest manifestations—but rather is expressive of a direct, immediate, and personal interest in woman herself, who "out of the depths" of her physical sufferings looks up to us for relief or release. "That man is to be pitied," says Coleridge, "whose own mother has not rendered all other mothers sacred to him;" and woman, whether mother, wife, sister, or daughter, wears somewhat of a consecrated character to the true physician, and to know, to cure, or to palliate her diseases are the promptings of every noble and and chivalric impulse in his nature.

We are not prepared to range ourselves with those who think the former times were so much better in respect of woman's health, than are the present; with a cheerful optimism we would accept the explanation which Lisfranc gave more than a score of years ago, of the alleged increased frequency of uterine diseases, the essential part of the explanation being the increased knowledge of such diseases.

As evidence of such increased knowledge, observe the increase of its literature among us. Translations from the French, reprints from British

¹ Dictionnaire Philosophique, tome iii. p. 201.

authors, and original volumes from some of the leading men in the American profession are presented us. As physicians, we may rejoice at this affluence of the products of labour in this department of medicine; and as Americans, we can be justly proud of the contributions of such men as Meigs and Hodge, Bedford and Byford. And now a new candidate for favour, the work likewise of a countryman, presents itself, presents itself too just when recent editions of "West," "Byford," and "Hewitt," have been issued, as if there were no fear of the ordeal of a comparison with these standard volumes. And indeed were such an ordeal to be instituted, it would not result unfavourably to "Thomas."

We entered upon the examination of this work confident its pages would be found replete with interesting and practical instructions. That confidence has not been disappointed. The author, though comparatively a young man, is well known to the American profession, by his contributions to periodical medical literature, and by his occupying a prominent position as a medical teacher, having therein made for himself an enviable reputation with medical students as an attractive and instructive lecturer, happily illustrating the too much neglected truth, that the graces of true oratory, and even the impassioned fervor of eloquence, are not alien to a medical professorship. No wonder that Prof. Thomas, with his abilities and opportunities, should make a good book; the wonder would have been had he failed. And yet we cannot, even before entering into an analysis of the volume and presenting some criticisms upon several points, refrain from a regret that there is not *more of it*, for it seems to us some subjects, though not of major, but of some importance, have been omitted, some few others too briefly considered, while in one or two instances most unequal consideration, in reference to the emergencies of practice, is allotted to subjects illustrative of the last point; no physician cares to read as much in reference to *recurring fibroid*, or *super-involution*, conditions that he rarely, the first, probably, never meets with, as he does in regard to *sub-involution*, a condition of comparatively frequent occurrence, and which so often baffles his best efforts to cure.

The first chapter is entitled "An Historical Sketch of Uterine Pathology," in the preparation of which the author states he has drawn largely from contemporaneous writers. Similar sketches, some of them more extensive, may be found in the works of several recent authors upon the diseases of women, *e. g.*, Nonat,¹ Courty,² and Wright;³ but in the first and the third of those just mentioned, not a single allusion is made to American labours in this field, while the second briefly refers to "the American school to which we owe the first ovariectomies, and the generalization of the operation for vesico-vaginal fistula," mentioning in a foot-note the volumes of Dewees, Meigs, Bedford, and Hodge, and the contributions of Dr. W. L. Atlee, upon ovarian operations, to this Journal. Dr. Thomas speaks of McDowell and Atlee, as important contributors to this department of medicine, and especially lauds Marion Sims as having by the invention of his speculum marked an epoch, as Récamier with the speculum and Simpson with the uterine sound had previously done, in the progress of gynecology.

He, justly, does not favour the admission of women to the duties and responsibilities of medicine, even when limited to the professional care of

¹ *Traité Pratique des Maladies de l'Uterus.* Paris, 1860.

² *Traité Pratique des Maladies de l'Uterus et de ses Annexes.* Paris, 1866.

³ *Uterine Disorders.* London, 1867.

their own sex ; after a brief historical sketch of this question, which is now vexing the minds of the profession in some parts of the country, he thus states :—

“There is no resisting the evidence of history, that, in spite of opportunities and incentives, female practitioners have failed, in times past, not only to advance, but even to maintain the integrity of the art intrusted to their hands.”

Chapter II. is entitled the “Etiology of Uterine Diseases in America.” The *causes* presented are :—

“Want of fresh air and exercise. Excessive development of the nervous system. Improprieties of dress. Imprudence during menstruation. Imprudence after parturition. Prevention of conception and induction of abortion. Marriage with existing uterine disease.”

It seems to us that some of these causes are not peculiar to American women ; and while the chapter devoted to their discussion is valuable, yet we believe its value would be greater were it simply upon the etiology of uterine diseases, though of course more space would be required.

Chapter III. is devoted to “Diagnosis ;” it contains numerous illustrations of the different means for and methods of exploration of the female organs—among the former, of the author’s telescopic speculum and of his modification of Sims’, and of Cusco’s speculum—and much practical instruction admirably presented. In speaking of the uterine sound, the author greatly prefers the instrument as modified by Dr. Sims—“not a sound, but a probe, only a little larger than the ordinary surgical probe, composed of pure silver or copper, and perfectly pliable”—undoubtedly a just preference. But what are we to say of the well-nigh universal resort to this instrument in cases of suspected uterine disease, as told in the following passage ? “In my own practice I use it in almost every case which I examine, and never have I done injury to a patient except in a few rare cases where miscarriage was produced, no suspicion of pregnancy being entertained.” Those “few rare cases where miscarriage was produced” ought to enforce most strongly the rule, never to use the sound where there is the least suspicion of pregnancy. Pajot¹ recounts a case of complete retroflexion satisfactorily made out by the touch, and the patient then, as the period of her accouchement testified, pregnant some fifteen days or three weeks : the uterus was reduced spontaneously about the fourth month. Well does he add, *Si j’avoir introduit une sonde dans l’uterus!* He also declares himself of the opinion of Scanzoni that the sound is almost never indispensable for the diagnosis of uterine flexion.

Professor Thomas gives his “opinion that no case of uterine disease should be regarded as fully investigated unless the cavity of the uterus be probed. Of course there are, in some cases, contraindications to such a procedure, but where none exists it should be considered as essential to a thorough examination.” We will not say that our author exaggerates the value of the sound, though such an assertion would be sustained by many, but we sincerely believe that the contraindications to its use ought to have been, at least for the sake of those who are making their first essays with it, fully and explicitly stated.

In speaking of *sponge-tents*, the author refers with approbation to covering them with gold-beater’s skin, “as recently suggested by Prof. J. C.

¹ Archives Générales, vol. i. p. 226, 1867.

Nott,¹ formerly of Mobile." Courty² mentions such a covering being used in the sponge-tents made by M. Beaudassé Cazottes, at Montpellier.

With Chapter IV. the special consideration of diseases commences; an anatomical description precedes the discussion of the diseases of each organ, a plan the usefulness of which must be quite obvious. A chapter upon *embryology*, as it pertains to the development of the female sexual organs, would have been most instructive and useful; for such study is a key, as well observed by Courty, to those so-called malformations, more properly arrests of development—conditions normal at one or another period of the foetal state—some of which so seriously interfere with function, and demand surgical treatment.

We have no special remarks to make in regard to the contents of this fourth chapter, devoted to "Diseases of the Vulva," except on two points. The author, in speaking of *puddental hæmatocele*, says, "When the tumour is large, and we feel sure, on this account, that it will not undergo absorption, it is advisable to evacuate the blood-clot by incision." Would it not be safer to say, if the effusion be large and recent, be content with cold applications for a day or two, and then evacuate by incision? Professor Simpson taught us this lesson once in a case which we had an opportunity, through his kindness, of seeing with him.

In the therapeutics of *vulval pruritus* we find no mention of Dr. Dewees' favourite local application, the value of which has been indorsed by Dr. Meigs and others, a solution of bichloride of soda.

Chapter V. is upon "Rupture of the Perineum." The two operations given for the treatment of this lesion are Baker Brown's and Dr. Sims'. There might be a third added, Dr. Agnew's.³

"Vaginismus" is the subject of Chapter VI. Dr. Thomas states that this hyperæsthetic condition of the vaginal orifice was first described by Burns, who advised an operative procedure which has since been revived, and is at present regarded as the only reliable method of cure; that Dr. Marion Sims fully described the affection in 1861, recommending, with slight modifications, the operation of Burns, and that since that time it has been treated of by Michon, Debout, &c. The causes of this condition are, according to our author, as follows: "The hysterical diathesis; excoriations or fissures at the vulva; irritable tumour of the meatus; chronic metritis or vaginitis; pustular or vesicular eruptions on the vulva; neuro-mata." In the conclusion of the therapeutics of the disorder, we are taught that as the act of parturition would be very apt to remove the hyperæsthesia, and as sexual intercourse may be impossible under ordinary circumstances, "the patient may be thoroughly anæsthetized, in the hope that complete connection accomplished under the circumstances may result in pregnancy."

There are two or three matters involved here at which we wish to glance. Burns' exposition of the disorder we know only from the reference to it by Professor Simpson;⁴ Dr. Sims' paper upon "Vaginismus" was communicated by Dr. Tyler Smith to the London Obstetrical Society, November 6, 1861—the essential part of this paper will be found also in his work on *Uterine Surgery*.⁵ Dr. S. says that his paper was presented in December,

¹ See Richmond Journal, July, 1867, p. 103.

² Op. cit., p. 151.

³ Pennsylvania Hospital Reports, p. 61.

⁴ Clinical Lectures on Diseases of Women. Philadelphia, 1862.

⁵ Clinical Notes on Uterine Surgery. By J. Marion Sims, A. B., M. D., &c. American edition. New York, 1866.

1861, and will be found in the second volume of the *Obstetrical Transactions* (see *Uterine Surgery*, p. 321); but the date we have given is the correct one, and the paper will be found in the *third*, not the second, volume of the *Obstetrical Transactions*.

Dr. Sims' first case of *vaginismus* was observed in May, 1857. Now, nearly three months before the presentation of Dr. Sims' communication to the Obstetrical Society, an elaborate article by Debout,¹ bearing the title "Spasmodic Contraction of the Vaginal Sphincter, and its Treatment," was published in France; and subsequent numbers of the same journal in which the first article appeared contained additional articles upon the same subject by Michon, Huguier, and Debout—the last appearing October 15, 1861. From these articles we learn that the disease was regarded as either *symptomatic* or *essential*; that Roux met with a case in a Russian lady who had been married for several years without sexual congress ever having occurred, and he proposed to cure it by incision, but the patient refused; that in one of Dupuytren's clinical lectures upon fissure of the anus a case of vaginal spasm is alluded to as being cured by incision; that Michon records eleven cases, the first falling under his observation in 1847; and that Huguier, in his thesis published in 1837, narrates two cases, one of them observed in 1831. As to the etiology of the affection, Debout says:—

"It is a law of general pathology that when a muscular plane is covered with mucous membrane, if the latter be attacked by severe and protracted inflammation, the muscular fibres may become the seat of a spasmodic contraction: the persistence of this morbid condition leads to permanent contraction, examples of which may be found in the œsophagus and in the urethra. When the muscular plane is a sphincter, designed to close an opening, as the anus, the vulva, the eyelids, &c., it is often sufficient that the mucous membrane may be the seat of a lesion which causes an exaggeration of its normal sensibility—as a hyperæsthesia, a fissure, etc.—in order that the muscular spasm may be established."

In specifying the causes of vaginal spasm, Debout enumerates inflammation of the mucous membrane, of the mucous follicles, vagina, etc., but regards as the two most frequent, hyperæsthesia and fissure. As a predisposing cause, and it seems to us an important one, he dwells upon the anatomical disposition of the perineum which, in some women, being prolonged upward, the vaginal orifice opens above this structure so as to require the finger or speculum when introduced, while the patient is lying upon her back, to make an acute angle with the pubes. When a newly-married woman has this "vicious conformation," it is evident that intromission might be difficult, if not impossible. Debout still further states that the affection sometimes has its origin in the husband—excessive delicacy, timidity, deep sympathy, advanced age at which the marriage is contracted, previous abuse or congenital impotence, may prevent his surmounting the obstacle presented by the hymen; and hence the reiterated attempts at copulation only provoke irritation of the tissues, and then vaginal spasm follows. As to treatment, Huguier advocates incision; Michon, too, resorted to it in almost all his cases, but concludes that dilatation will answer in very many; while Debout refers to incision as *par trop brutal pour être le dernier mot de la science*; only in exceptional cases resorting to it, and then preferring the subcutaneous method. He advocates cold as a valuable agent for

¹ Bulletin Général de Thérapentique Médicale et Chirurgicale, August 15, 1861. Dr. Churchill (*Diseases of Women*, 5th edition, Dublin, 1864, p. 125) has fallen into the same error as to the publication of the papers of Debout and Michon, making them *succeed* instead of *precede* that of Dr. Sims.

overcoming simple hyperæsthesia—cold hip-baths, cold injections into the vagina—dilatation, if necessary, with caoutchouc bags; and where fissures exist, *abrupt* dilatation, as Récamier advised in anal fissure, with the fingers, or else by means of a bi-valved speculum introduced *closed*, withdrawn suddenly, its blades *separated*—of course the patient, in case either of these manœuvres being resorted to, should be anæsthetized. This much for some of the literature of the subject prior to any contribution from Dr. Sims. And we have occupied so great space already, that we are constrained to omit some two or three other topics which we had marked for reference. There is one, however, upon which we must say a few words, viz., the proposition originally advised and acted upon by “the family physician” referred to on p. 333, of Sims’ *Uterine Surgery*, but now deliberately authorized in certain cases of *vaginismus*, “the patient may be thoroughly anæsthetized, in the hope that complete connection, accomplished under these circumstances, may result in pregnancy.” We did not expect that this practice, after having been so “vigorously” criticized, would be indorsed by any one. One¹ whose pure and noble character we of the medical guild can never too much admire, wrote:—

“I would be content that we might procreate like trees, without conjunction, or that there were some way to perpetuate the world without this trivial and vulgar way of coition. It is the foolishlest act a wise man commits in all his life, nor is there anything that will more deject his cooled imagination, when he shall consider what an odd and unworthy piece of folly he hath committed.”

And another eminent author,² of a like pure and gentle life, though judging hastily from some things he has written, some might think otherwise, has through one of his characters said:—

“That provision should be made for continuing the race of so great, so exalted, and godlike a being as man, I am far from denying; but philosophy speaks freely of everything; and therefore I still think, and do maintain it to be a pity, that it should be done by means of a passion, which bends down the faculties, and turns all the wisdom, contemplations, and operations of the soul backwards—a passion which couples and equals wise men with fools, and makes us come out of our caverns and hiding places more like satyrs and four-footed beasts than men.”

But now “the passion which likens men to satyrs and four-footed beasts,” and “the vulgar way of coition,” rise to the dignity of an important therapeutic agent; “the delicacy of Diogenes and Plato would not recalcitrate,” while the benevolent physician, his heart brimming and his eyes suffused with pity, and his mind exalted in the contemplation of the boundless resources of his art, with ether or chloroform prepares the trembling, shrinking wife for the embraces of her husband, hoping that she may become pregnant, and then be cured of her horrid vaginismus.

Vaginitis is the subject of Chapter VII. This disease is divided into *simple*, *specific*, and *granular*—divisions similar to those made by Guérin.⁴ In speaking of the second variety, the author refers to the fact that the disease may be concealed for some time in the posterior vaginal cul-de-sac; explaining, as stated by Guérin, how women, apparently healthy, and who sincerely believe they are, may transmit gonorrhœa. A case mentioned by this French author⁵ well illustrates this truth—possibly, too, may help to

¹ London Medical Times and Gazette, Feb. 1867.

² Sir Thos. Browne, *Religio Medici*.

³ Sterne.

⁴ *Maladies des Organes Génitaux Externes de la Femme*.

⁵ *Op. cit.*, p. 287.

enforce the famous injunction of the elder Weller—and so we take the liberty of giving it: A wife received gonorrhœa from her husband, was treated for it, and believed herself well; she noticed her linen was stained a little before and after each menstruation, but no discharge whatever in the inter-menstrual period; her husband died, and, more than three years after having first had gonorrhœa, being passionately in love with a married man, she yielded, just after menstruating, to his passion, and gave him gonorrhœa.

Atresia Vaginæ is the subject of the 8th chapter. Under the head of treatment, Dr. Thomas says:—

“The sudden evacuation of menstrual blood, which has been for a long time imprisoned in the uterus and vagina, is always a procedure attended by danger. Even where the obstruction has been only an obturator hymen, such an operation has been followed by endometritis, peritonitis, and death. The danger is probably dependent upon the fact that the imprisoned fluid distends the uterus and Fallopian tubes, and renders them so sensitive that the admission of air produces a septic endometritis, which in its course and termination resembles closely the most common form of puerperal fever.” p. 139.

This is stating the cause of death, in such cases, more strongly than Dr. Hewitt does, who says: “A certain number of deaths are to be attributed to purulent absorption, the admission of air producing decomposition of blood and pyæmia;” but he also recognizes the explanation given by Bernutz of other fatal cases. The latter states,² that intra-peritoneal effusion of a portion of the menstrual fluid is liable to occur, consequent upon so slight an operation as incising an imperforate hymen, or separating the adherent lips of the os uteri, because the operation evokes the contractility of the uterus; and that this contractility, instead of ceasing after the abrupt expulsion of the greater part of the liquid contained in it, persists, and thus forces the blood contained in the tubes against the walls of the pseudo-membranous cyst connecting the tube and ovary: too often these walls rupture, and peritoneal effusion occurs. This is not a question of merely speculative interest, for if Bernutz be right, the rules³ he lays down for the evacuation of collections of menstrual blood ought to be followed.

Prolapsus Vaginæ and *Vaginal Herniæ* are the subjects of the 9th chapter.

The 10th is devoted to *Fistulæ of the Female Genital Organs*. In reference to the causation of these lesions, Professor Thomas quotes from Baker Brown’s report to the London Obstetrical Society, statistics showing most conclusively that these lesions are to be attributed to “protracted labour,” rather than to the “use of instruments,” and adds that the experience of Drs. Sims, Emmet, and Bozeman is confirmatory of this position. It is well for the profession to understand this truth, in order that they may be guided in practice how to prevent these accidents, and also be deterred from censuring such misfortunes in the practice of others, when the party who called in at “the eleventh hour” of protracted labour, effects delivery by means of the forceps, or other obstetrical instruments. And yet we may go too far, for all genito-urinary fistulæ in the female do not occur from protracted labour; instrumental interference may produce them; nor is it essential, in other cases, for their occurrence that the labour should be prolonged. We should not forget the statement made by Professor Simp-

¹ Diseases of Women, Amer. edition, p. 435.

² Clinique Médicale sur les Maladies de Femmes, vol. i. p. 68.

³ Op. cit., pp. 302, 303.

son¹—a vesico-vaginal fistula caused by a tyro using a lancet with the design of perforating the membranes, but penetrating the bladder instead; nor the case falling under the notice of Dr. J. Matthews Duncan,² where a similar lesion resulted from the improper use of the forceps. And, on the other hand, we do not believe, as we have already said, that the labour must necessarily be protracted in order that these fistulæ may occur, for let a tissue be compressed violently between two unyielding surfaces, and continuously, its vitality may probably be as effectually destroyed in an hour as in a day.

The description the author gives of the method of treating the ordinary forms of these lesions, leaves nothing to be desired; it is excellent, clear, concise. The illustrations, too, are numerous and excellent; two of them, as well as several others in the volume, are credited to Wieland and Dubrisay, and we confess, to our shame, we know not who they are; and Dr. Thomas nowhere informs us. On page 183 we read:—

“In addition to the varieties of urinary fistulæ mentioned here, certain rare instances of union between the ureters and vagina or uterus have been recorded. A case of what the author styles uretero-uterine fistula may be found in the *Dictionnaire de Médecine*, vol. xxx., from the pen of M. Berard.”

There is then quoted “the logical process of reasoning by which the diagnosis was made.” Now, this lesion is not what M. Berard alone styles uretero-uterine fistula; the condition and the name have been recognized by others as well. We would be glad had Dr. Thomas at least noticed Da Costa’s proposed plan of treating this variety of fistula. In reference to “certain rare cases of union between one of the ureters and the vagina,” or uretero-vaginal fistulæ, some months since we made faithful search of all the authorities at our command, and diligent inquiry of several eminent surgeons, respecting such a case, but in vain; and we regret that Professor Thomas has not given any bibliographic references upon this topic, so that we might renew our quest with the certainty of success.

From Chapter XII. to XX., including the first, we have the subjects of *uterine inflammation and ulceration* in their various forms, and their *treatment*, considered in a manner so clear, so satisfactory, and so practical, that we feel like declaring it, in our opinion, among the most valuable parts of the treatise.

“Displacements of the Uterus” follow, occupying nearly seventy pages. This chapter will be found very useful and instructive, and entirely satisfactory to all, except those who base their uterine pathology upon uterine displacements—constantly have their mouths full of fallen wombs and pessaries.

“Inversion of the Uterus” is considered in Chapter XXIV. Professor Thomas recognizes but two causes of this condition, viz: “1. Relaxation and inertia of the uterine walls; 2. Downward traction or pressure.” Nevertheless, as pointed out by Dr. Duncan,³ the uterus may be inverted not merely spontaneously, as the phrase is, but inverted by its own active efforts—cases which, more than others, deserve the name of intussusception; at least such would be the conclusion after reading his clear exposition of the mechanism of uterine inversion.

The *treatment* of this condition Dr. Thomas gives very briefly; he

¹ Op. cit., p. 19.

² Researches in Obstetrics. Edinburgh, 1868, p. 402.

³ Op. cit., p. 374.

enumerates three methods of reduction of the inverted "non-pregnant" (why not simply *chronic* inversion?) uterus as follows:—

"I. The method of Viardel, dilating by the fingers the constricting neck and forcing up first the tissue which came forth last.

"II. The method of White, of Buffalo, by indenting the fundus, and thus returning first the part which first escaped.

"III. The method of Nöeggerath, by indenting the cornua, by pressure over the lateral surfaces of the tumour so as to re-invert one or both of these parts, thus imitating the occurrence of the accident, according to the theory of Kiwisch."

After a quotation from Jacquemier,¹ and one from Becquerel,² a remark or two as to the first two methods may not be inappropriate. Jacquemier mentions two methods of reducing an inverted uterus: first, the fingers formed into a cone are to be pressed upon the centre of the tumour; second, the tumour is embraced by means of the fingers distributed around its pedicle, and the operator commences as in the reduction of a hernia in causing those parts which escaped last to be restored first. Becquerel in referring to the method, dite de Viardel, says that it is necessary so far as possible to cause those parts which escaped last to enter first, etc.

It seems evident that in the first method given by Jacquemier—though he alludes to acute inversion—the operator would simply be doing what Dr. Thomas claims is Dr. White's operation, dimpling or indenting the fundus, "and using it as a wedge to dilate the neck and os;" certainly too, this process of "doubling in or dimpling the fundus" is not claimed by Dr. White to be applicable except to recent cases—at least such is his statement in the interesting paper published in this Journal, July, 1858.

Neither Jacquemier in his second method, nor Becquerel in describing the method of Viardel, while both explicitly state the importance of returning first that portion of the uterus which escaped last, is explicit as to the means by which this is to be accomplished. But, on the other hand, for the clearest and best exposition of this point, an exposition verified by several successful cases, the profession is indebted to Dr. Emmet,³ and the method should be called by his name rather than by that of Viardel.

We come next to "Peri-uterine Cellulitis," "Pelvic Peritonitis," and "Pelvic Abscess," presented in their order in three successive chapters, while immediately following there is a chapter upon "Pelvic Hæmatocele;" and still further on in the work, with several chapters intervening, the disorders of menstruation are considered. The study of menstruation and its derangements, ought to precede, it seems to us, the first three subjects, for the obvious reason that the latter frequently have their origin in the former. So, too, following in *place*, as it often does in *practice*, disorders of menstruation, *hæmatocele* might be placed; while *pelvic abscess*, being in the majority of cases simply a result of *pelvic cellulitis*, properly belongs to the chapter devoted to that subject—or, at least, might appropriately be placed in a chapter immediately following it.

This criticism made—and we make it with considerable hesitation, for

¹ Manuel des Accouchements. Paris, 1846. Volume ii. 579.

² Traité Clinique des Maladies de l'Uterus et de ses Annexes. Paris, 1859. Volume ii. 314.

³ American Journal of the Medical Sciences, January, 1866, January, 1868; see also monograph entitled, Reduction of Inverted Uteri by a New Method, by Thos. Addis Emmet, M. D., Surgeon in charge of the New York State Woman's Hospital, New York, 1866.

all through the book we see so many evidences of thoughtful, clear arrangement, that we are half ready to distrust our own judgment as to the point presented, and to believe that the author had excellent reasons, though we cannot see them, for the order he has selected—we can only speak in the warmest commendation of the three chapters first referred to. We are especially rejoiced to find one systematic writer upon diseases of women who clearly draws the line of distinction between inflammation of the connective and of the peritoneal tissue of the pelvis.

"Fibrous Tumours" are considered in Chapter XXIX., and "Polypi" in Chapter XXX. We are somewhat surprised not to find in the large array given of instruments for the removal of pedunculated fibroids, that of the wire rope *écraseur* of J. Braxton Hicks. It is, we believe, equal, if not superior to any other form of *écraseur* for such work, as well as for amputation of the cervix uteri.

Chapter XXXI. is upon "Cancer of the Uterus." Professor Thomas speaks of the termination of this disease being "always the same—death;" but among the immediate causes of a fatal issue he omits one which has been observed by others. Dr. Beatty,² we believe, first pointed it out. It arises from extension of the disease to the bladder, and not ulceration of that viscus, but obstruction of the ureters, leading to non-elimination of urine, and hence uræmic poisoning; and from this latter cause the last few days of the patient's life, who may for weeks or months live a daily martyr to untold agonies of pain, may be comparatively free from suffering, and at last have a true *euthanasia*. Cruveilhier³ states that frequently the inferior extremities of the ureters, in cases of cancer of the uterus, are enveloped in cancerous masses which compress them—this compression amounting sometimes to complete obliteration, but that this obliteration does not have the unfortunate results that theory would seem to indicate. However, in the light of Dr. Beatty's observations, the so-called "unfortunate results" are not to be deprecated, but regarded as constituting "the most merciful manner in which the life of the unfortunate victim of this inexorable disease can be brought to a close."⁴

We knew of a recent case of uterine cancer, where, for at least a week previous to dissolution, no urine found its way to the bladder, and the symptoms of uræmia were well marked.

We omit reference to the chapters intervening between that devoted to "Cancer of the Uterus," and the XXXVth, which is entitled "Functional Disorders of the Uterus," these embracing "Dysmenorrhœa," "Menorrhagia," "Amenorrhœa," "Sterility," and "Leucorrhœa." Whether leucorrhœa, which frequently is a mere symptom of organic change, and sterility, which is often dependent upon causes entirely extrinsic from the uterus, are appropriately classed here, might admit of dispute, though we are quite willing to concede, with good Sir Roger de Coverley, in his observations with reference to another question, "much may be said on both sides."

Dysmenorrhœa is the first of the functional uterine disorders discussed, the author accepting the divisions which have been made, viz: Neuralgic Dysmenorrhœa, Congestive Dysmenorrhœa, Inflammatory Dysmenorrhœa, Obstructive Dysmenorrhœa, Membranous Dysmenorrhœa. For therapeutic

¹ Obstetrical Transactions, vol. iii. p. 346.

² Contributions to Medicine and Midwifery, p. 346. Dublin, 1866.

³ Anatomie Pathologique, xxvii. livraison, p. 4.

⁴ Dr. Beatty, op. cit.

tical purposes—though of this we are not sure, for in the multiplicity of varieties the practitioner may be sorely puzzled in which to place a given case, especially when, as frequently occurs, it presents the characters of two or more of them—this division may be the best. Nevertheless, we believe that *neuralgic*, *congestive*, and *mechanical* would include all that is necessary to be considered under this head. For example, the so-called membranous dysmenorrhœa is—at least in the great majority of cases—an expression of inflammation of the lining membrane of the uterine cavity, of uterine engorgement, of fibroids, of polypi, etc.; and, moreover, the *difficulty* of menstrual *secretion* and excretion, one or both, may not be the only salient phenomenon, the menorrhagia may be quite as much so.

In defining *menorrhagia* and *metrorrhagia* Professor Thomas says:—

“A patient who menstruates too profusely is said to suffer from menorrhagia, while one who loses blood—not only at menstrual periods, but continuously—is said to suffer from metrorrhagia.”

“Menstruates too profusely” is somewhat indefinite, and loss of blood need not be *continuous* to constitute metrorrhagia.

The author speaks of amenorrhœa as “an absence of the menstrual flow in a woman in whom it should naturally exist.” We should prefer the definition which Bernutz¹ gives, making amenorrhœa signify “absence of the menstrual flow, and, by extension, diminution of that flow, in order to comprise under a single term two conditions of the same functional disorder which cannot be nosologically separated from each other.”

On the same page Professor Thomas says:—

“That the discharge of blood, which, occurring at monthly periods, constitutes menstruation, is a true hemorrhage, dependent upon the process of ovulation, is now regarded as a settled fact by most progressive physiologists.”

But is not “the discharge of blood,” which Dr. Thomas here says “constitutes menstruation,” simply the crisis and conclusion of a series of phenomena, the discharge of blood not being a function, but a product? As to menstruation being dependent upon ovulation, we know that such is the view entertained by many excellent authorities; certainly “this settled fact” finds no support in the laborious and careful investigations of Dr. Ritchie,² showing, as they do, that the menstrual flow may occur for successive periods without the evolution of a single ovum, and that mature ova are often extruded without this flow; and we feel inclined to accept the statement of Dr. Tilt,³ “that ovulation and menstruation are not convertible terms, and that they relate to phenomena which may be associated with, but are often entirely separated one from the other.”

As to the source of the menstrual flow, Professor Thomas attributes it entirely to the mucous membrane of the uterus, and such is the almost universal teaching of authors. And yet, with the facts mentioned by Bernutz⁴ and Goupil, where the Fallopian tubes, occluded at their uterine extremities, have been found distended with blood; and the admission of Dr. Duncan,⁵ that some little blood may no doubt be excreted from the tubes in natural menstruation, we can hardly admit the uterus as the sole

¹ Nouveau Dictionnaire de Médecine et de Chirurgie Pratique, tome deuxième, article Aménorrhée.

² Ovarian Physiology and Pathology, p. 119. London, 1865.

³ Uterine and Ovarian Inflammation, p. 67. London, 1862.

⁴ Op. cit., tome première.

⁵ Fecundity, Fertility, and Sterility, p. 328. Edinburgh, 1866.

source of the menstrual flow. But one of the most interesting facts bearing upon this point we received a few days since in a communication from Professor Chisholm, of Charleston, South Carolina. The case is briefly this: a patient was subjected to ovariectomy, and the Fallopian tube included with the pedicle in the external incision. A short time subsequently menstruation occurred, and coincident with the flow from the uterus there was a sanguineous discharge from this tube.

Chapter XXXVIII., upon *Gonorrhœa*, is an excellent one. We are not aware that any writer upon diseases of women would have the temerity, after the manner of Von Troil's chapter upon "Snakes in Iceland," referred to by De Quincey—"Of snakes in Iceland there are none"—to make a chapter upon leucorrhœa, running thus—"Of leucorrhœa, as an essential disorder, there is none;" and we are not sure that in a therapeutic point of view such a step would be advisable. Nevertheless, the student of uterine pathology must observe that a leucorrhœa demanding professional interference rarely exists, unless as the result of a vaginitis or an internal metritis, whether cervical or "corporeal," whether attended with ulcerations, granulations, fungous growths, etc. or not. Professor Pajot¹ says: "A writer upon internal pathology, who, after having treated of bronchitis, of pleurisy, and of pneumonia, should introduce into the section upon pulmonary affections a malady bearing the title 'Des Crachats,' would not do a more extraordinary thing than he does who makes leucorrhœa a distinct malady."

Since this discharge, as Professor Pajot observes, is but a symptom common to various pathological states, we sincerely believe that it would be better, in regard for scientific accuracy, to consider it solely in connection with those states.

Amputation of the Neck of the Uterus is the subject of Chapter XL. In speaking of the *varieties of the operation*, our author states that in some instances, "cancer, for example, it is necessary to remove the entire cervix, and even as much tissue as possible, from that portion of the organ above the vaginal attachment." He does not mention, however, Huguier's method. On reverting to page 289 we read as follows (he is speaking of *uterine prolapse*):—

"So frequent is the occurrence of hypertrophic elongation of the cervix, that in 1858 M. Huguier, of Paris, stated before the Academy of Medicine in that city, that as a general rule the cases regarded as due to descent were not so, but were instances of this elongation which produced eversion of the vagina. In 1860 he published a work in maintenance of this view, and strongly recommended amputation of this hypertrophied part, or rather as much of it as existed below the vaginal attachment."

Our reading of Huguier's *Memoir*² would lead us to a somewhat different statement, in one or two respects, of his views to that which Professor Thomas has given. The memoir is divided into two parts, the one treating of *infra-vaginal*, and the other of *supra-vaginal* hypertrophic elongation of the uterine neck, either condition simulating prolapse of the uterus; but it is only in the *supra-vaginal* form that vaginal prolapse and eversion occurred, and that in the treatment of this variety the amputation of the neck must be³ "au-dessus de l'insertion du vagin plus ou moins près

¹ Arch. Générales, vol. i. 1867, p. 223.

² Mémoire sur les Allongements Hypertrophiques du Col de l'Uterus. Paris, 1860.

³ Op. cit., p. 219.

du corps de l'organe, suivant le degré de l'allongement." In the infra-vaginal form the resection of the neck should be done at half a centimetre below the insertion of the vagina.

Diseases of the ovaries occupy the last one hundred and odd pages, except some three or four devoted to those of the Fallopian tubes. Other engagements, as well as the fact that this review has grown to an unanticipated length, will prevent our making a detailed analysis of these several chapters, excellent as they are. We can glance at only two or three points.

On page 566 the author gives, under the subject of *ovariotomy*, "the results obtained by operators who have become eminent in connection with it during the past ten or fifteen years." We find the names of but Drs. Kimball, W. L. and J. L. Atlee and Peaslee among American operators. We think that this list might have been justly extended. For example, Dr. A. Dunlap, of Springfield, Ohio, has operated thirty-seven times, and had twenty-eight recoveries; and his statistics,¹ undoubtedly omitted from an oversight, especially should be given, as on page 561 we read:—

"Since this period"—i. e., that of McDowell, Lizars, and Nathan Smith—"Atlee, Peaslee, Kimball, and Dunlap have been most influential in establishing the operation in America."

On page 560 Professor Thomas states on the authority of Velpeau, that the removal of large ovarian cysts "was discussed in 1722 by Schlenker, in 1731 by Willius, etc." This proposition was made still earlier. Schorkopff,² *Dissertatio medica inauguralis de hydrope ovarii*, February, 1685, positively states that "extirpation of the ovary itself will more certainly effect a cure, if it did not seem so cruel and dangerous."

On page 561, in a foot-note, Professor Thomas thus refers to Mr. Baker Brown's neglect to mention American surgeons in connection with ovariotomy:—

"Dr. Baker Brown's historical sketch of this operation commences: 'I do not purpose to give a history of the operation of ovariotomy.' The necessity for this declaration will be fully appreciated when it is stated that nowhere in his notice is the name of McDowell, Atlee, or any other American surgeon to be found." We might have quoted and directly contradicted the statement made by Mr. Brown,³ "The first who attempted extirpation, appears to have been Aummonier of Rouen, in 1782, and he was successful," for it appears that what has passed for many years for an ovariotomy, figuring as such in statistical tables,⁴ and the operator heading the list of illustrious names, was really the opening of a pelvic abscess some six or seven weeks after accouchement, by Laumonier⁵ of Rouen, in the year 1776, Mr. Brown being wrong as to name, date, and fact.

On page 595, in the consideration of solid ovarian tumours, Professor Thomas gives to the variety spoken of by most authors as *dermoid cysts*, the name of *histoid*, an excellent designation it seems to us, and includes

¹ Dr. D.'s statistics will be found in this Journal, 1862. We have given them up to the present.

² Etude sur l'Hydropsie Enkystée de l'Ovarie et son Traitement Chirurgical. By Sigismond Laskowski. Paris, 1867, p. 55.

³ Surgical Diseases of Women. London, 1861, p. 365.

⁴ See on Tumours of the Uterus, p. 264. Also Transactions of the American Medical Association, vol. iv. p. 286, etc.

⁵ Thèse de M. Herreroa. Paris, 1864. Also, *Obstetrical Transactions*, vol. iii. p. 42.

under it three sub-varieties, viz., *Dermoid*, *Pileous*, and *Adipose*; but when we remember that the contents of these cysts vary, that we may have bones, teeth, gelatiniform material, as well as hair, skin, fatty matter, etc., and that two or more of these various tissues or substances may be in the same cyst, it seems to us that these sub-divisions are not only needless, but objectionable, as not embracing all the different forms, and as being, each one, too exclusive.

The whole subject of ovarian dermoid—histoid in Dr. Thomas's nomenclature—cysts, is one of great interest, more speculative, however, than practical, since interference with them is not required on the part of the practitioner; nevertheless he should know most positively that they are not the evidence of conception, and adopting the language of Dr. Ritchie,¹ we may say that "every dermoid cyst of the ovary is an ovum, which has undergone a certain amount of development, that it is a perverted attempt at parthenogenesis."

And now, in taking leave of this treatise, we can frankly say that its value will be great to the physician, and especially to the medical student. Its arrangement is excellent, its expositions clear and practical, its style singularly free from mannerism, but polished, while the bibliographic research of the author, though quite extensive, is not allowed to overshadow the lessons of his personal experience. It contains vastly more that is worthy of commendation than it does affording ground for criticism; and such critical observations as we have made, in preference to the doubtful iterations and reiterations of laudatory adjectives, must be regarded mainly as additions or supplementary remarks, rather than corrections or fault-findings.

T. P.

ART. XVIII.—*Das Cholera Contagium*. Botanische Untersuchungen, Aerzten und Naturforschern mitgetheilt von Dr. ERNST HALLIER, Professor zu Jena. Mit einer Kupfertafel. Leipzig, 1867.
On Cholera Contagium. By Professor HALLIER of Jena.

THIS brochure of Professor Hallier is particularly interesting, as it bears the impress of care and candor, and of having been the work of one well fitted for the office by previous study and familiarity, both with the life history of the fungi, and the best methods of investigating the same. Unfortunately, Prof. H. has not furnished measurements of the various objects studied, an omission which seriously detracts from the value of microscopic work, and as regards some points may even render it valueless. In this case, however, the plant which is dealt with being well known, measurements are not as essential as they often are.

After stating various details to satisfy his readers as to the purity and condition of the cholera stools, which he experimented upon, the Professor describes the peculiar fungoid bodies, which he found abundant therein, as follows. The translations are made as literal as any respect for our language will allow:—

"Chrome yellow or golden yellow, rarely brownish or reddish-brown bodies are to be seen. A part of them have at first sight a very irregular form, as

¹ *Ovarian Physiology and Pathology*. London, 1865, p. 175.

though they were of inorganic origin. Here and there may be found single, globose, or cylindrical cysts, in which a number of shining yellow spores are inclosed. These cysts vary very much in size. The more general form, especially among the larger ones, is the globose. Also the size of the spores is very variable, as one may see by comparison of the figures. Often the cysts are plainly going to ruin, which certainly takes place in two ways. Either the swelling spores project out through the mostly, in this case, still thin walls of the cysts, or the cyst wall itself swells up into a gelatinous mass, and finally disappears altogether, so that the spores are set free. But in this case, generally, the spores already before their being set free are converted into *Micrococcus colonies*¹ (*i. e.*, collections of small cells). Not seldom may one see cysts robbed, their spores lying about empty and in fragments. But if, as is generally the case, the spores resolve themselves into the micrococci-colonies by a continuous division of their contents, both spore and cyst-wall swell up and become very soft and thick, as one can easily demonstrate by light pressure on the cover glass. Now the spores are no longer to be seen plainly, but through the thick cyst-wall. These cyst-heaps have mostly the appearance of formless, gelatinous masses, and show an organic structure only on careful examination."

The Dr.'s view of the action of these fungi upon the animal economy is that it is not systemic, but local, not an affection of the blood resulting from the entrance into it of the spores, but rather an influence exerted by them on the intestinal epithelium. Thus in speaking of some bottles of cholera stools from Berlin, he says:—

"In the contents of the bowels, the different stages of the beleaguering and destroying of the intestinal epithelium by the micrococcus could be very beautifully studied. It is in this manner, as I have many times shown, that the destruction of an animal tissue by a vegetable parasite commences. The cells of the micrococcus place themselves in great numbers firmly upon the tissue element, multiply upon it, and decompose it. Dr. Thomé is right in ascribing to these small cells the destruction of the intestinal wall, the epithelium in the first place; for, as we shall hereafter see, they destroy every nitrogenized organic body, if sufficient moisture and warmth be present. They are, in our case, always coloured yellow or brown, and give, therefore, to the epithelium generally a dark-brown appearance."

The Dr. cultivated these microphytes frequently and in various solutions, with varying success, but without ever, at least as detailed, contradictory results.

The results obtained in syrup, the temperature of the room being from 16 to 25° R., are given below.

"On the third day there appeared on the surface of the liquid a thin layer of small cells (or as it is in the German, small-celled *Micrococcus*), part of them passing into 'torula forms,' *i. e.*, united into little chains, similar to those seen in the ordinary yeast plant, 'others taking on the characters of *Cryptococcus*,' *i. e.*, in more or less irregular masses."

The Crypto-coccaceæ constitute one of Kützing's families of the algæ or sea weeds. In most cases, if not always, they are not algæ at all, but early, immature forms of various species of the mildew fungi. They consist of more or less globose masses of minute cells. But to continue the account of the experiment:—

¹ Owing to the fact that many genera and species, if not families of fungi, have been formed and named from different stages in the life of the same plant, not only has the synonymy become almost endless, but the habit has arisen of using generic terms to express a stage of a known growth. Thus *Micrococcus* is used by Dr. H. to express the stage when the plant consists of numerous roundish very small cells, more or less disconnected, while when the cells are large it is *Macrococcus*.

"On the fourth day the *micrococci* formed a very thick, tender skin or layer (*Mycoderma*), which in raising up often broke into roundish balls similar to colonies. In the course of the following day the torula forms grew into chain-bearing threads, and formed in this way very vigorous plants of *Oidium lactis*, of the form which presages the *mucor* formation. The oidium has, in all respects, the form which always precedes the *Mucor racemosus* Fres. Upon the twigs of a, here and there septate, filament, filled with granular protoplasm, were single, or in smaller or greater chains, the *macroconidiæ*, which are destined by germination to produce the *mucor* plant."

In order to make this account more intelligible to those unacquainted with the results of the recent researches on the Fungi, the following sketch is here inserted:—

If sour milk be examined, branched fungoid filaments will be found growing abundantly, especially near the edges. These filaments are the *Oidium lactis* of authors, formerly supposed to be a distinct plant, now known to be merely an early stage of a mould. If these be allowed to develop in a nitrogenous solution, under certain circumstances not very clearly understood, they produce at their extremities chains of numerous small, round cells (*conidiæ* or *microconidiæ*), which cells dropping off, develop into similar filaments. In this stage the plant represents the genus *Penicillium* of authors. Often, however, besides or instead of producing these small cells, the filament will produce much larger cells (*macroconidiæ*), singly or in rows on the ends of the twigs. When these fall off and germinate, they develop into filaments, whose ends swell up into very large globes, so large as to be discernible by the unaided eye, which globes are densely crowded with protoplasm. An outgrowth from the wall at the base of these globes (*sporangia* or *spore cases*) now separates them from the remainder of the filament.

The sporangia, thus formed, continue to grow, their protoplasmic contents at the same time becoming more dense, so that as they increase in size they become more and more opaque. Finally there is formed in them, by the process of free cell formation, an immense number of minute, globular, thick-walled cells the *spores*. Filaments which produce such sporangia constitute our ordinary moulds (*Mucor*). *Oidium*, *Penicillium*, *Mucor*, are not different genera of fungi, but merely different stages in the life history of one and the same plant. Some believe that under certain circumstances two other forms are produced, *Achlya* and *Tilletia*, but the relations of these are at present extremely obscure.

The further cultivation of the stools in syrup, produced under Dr. H.'s observation nothing beyond what has been detailed, the *macroconidiæ* refusing entirely to germinate, soon decomposing and disappearing. The results may, therefore, be summed up to be simply the production of *Penicillium* and *Oidium lactis* from the cysts or spores in the cholera stools.

On the 25th of May, some of the cholera stool cysts were placed in the culture apparatus, in which were cooked beef and syrup, the temperature being from 16 to 25° R. By the 2d of June¹ entirely normal *Oidium lactis* was abundant.

"The micrococci swelled into globose cells, which germinated. The seed-threads and its branches, at their ends, were contracted into simple chains of oidium conidiæ." . . . "Already by the 2d of June¹ the oidium had fully disappeared, the reaction of the substratum was strongly alkaline; and gave off during the development a very disagreeable smell. Everywhere in the fluid were masses

¹ So in the original, evidently a misprint as to dates.

of yellow-brown micrococcus. In the course of the following day the ustilaginous plant formed itself with numerous cysts. The mycelium of the same was so fragile that one could obtain only small pieces of it, but the cysts lay everywhere and made numerous cell-colonies of the same form as those found in the cholera stools. The development of the micrococcus out of the cysts is the same as in the cholera stools. The spores swell up strongly, their walls become gelatinous and finally disappear, whereby their contents are set free as micrococcus. They are motionless, as are all the ustilaginous fruit. The fibres of flesh were beset and destroyed by the micrococcus in the same way as the intestinal epithelium. They dissolve themselves into their elements, becoming very fragile, and at last thus melt away into a clear slime resembling the fresh white of an egg. Masses of the destroyed cysts were somewhat common, as in the cholera stools."

The ustilaginei here spoken of are a so-called family of fungi, which are parasitic, and, in most cases, grow in the interior tissues of plants, causing their destruction and replacing their parenchyma by fibrous or dark grumous masses, converted at last into a dryish-black powder, which consists entirely of minute spores. As an example of such a fungus may be mentioned the *Ustilago maidis*. This attacks the young fruit of the maize plant, and constitutes the dark grumous masses which so commonly replace the ears of the Indian corn. The *tilletiæ* are a sub-family of the ustilaginei. In their early stages they consist of a stroma of interwoven fragile filaments, whilst the ustilaginei proper have at first a mucilaginous or grumous-mucous stroma, entire or broken up into variously conglomerated masses. They are all of them, most probably, peculiar generations of possibly very various fungi.

The extracts which have been given indicate the method of the cultivation and the animus of all the experiments; indeed, they comprise the most important of the latter. Prof. Hallier sums up the results of all his labour as follows:—

"If we place the united results of all the culture together, it will appear prominent at a glance that in all there were only different fungal generations of one and the same species. What is that fungus, that species which contains the generations, *penicillium* (*crustaceum*), *mucor* (*racemosus*), *tilletia*, and *achlya*? But none of these four generations were in the rice-water stools, only a fifth, which the systematist would place as a genus of *urocystis*. This form of fruit has hitherto never been found anywhere by any investigator, and yet it is impossible that the human intestine can be its only, in a measure, normal home. . . . This form must certainly occur somewhere else in nature, and this occurrence, if the fungus be in reality the contagion, must be looked upon as the cholera centre. Since I have never found, except that instance with the milk, which I described in *Schultze's Archives*, anything like the cysts in my innumerable cultivations of *penicillium* and *mucor*, so must I assume, that the cyst form is not autochthonous in Germany. The cholera wanders from India—if the cyst-form be the cause of the cholera, so must it also. But it may also wander in, if it be a mere follower of the cholera, if it merely treads after it as a companion, finding a favourable ground in the intestine ruined by cholera."

Dr. H. then shows that the only condition the fungus could find both in India and the intestine, and *not* in Germany, is warmth. The previous experiments had shown that the presence of moisture, and nitrogenous materials, were necessary for the production of its fructification. He next investigated the effect of heat. The result of these experiments was that no increase of cysts took place in cholera stools cultivated under otherwise the most favourable circumstances, at a temperature of 9° R. Again in various experiments *Penicillium*, *Mucor racemosus*, and their spores were

grown in syrups containing flesh or blood, at a temperature of from 25° to 35° R. (89° to 112° F.), and as a result the cysts were formed always in abundance "as he never before saw them except in cholera stools." Finally—

"Fresh cow's intestine was placed in the culture apparatus with cholera stools from Elberfeld and some syrup on the 12th of June, temperature 20° to 22° R. On the 16th, vigorous cyst form and beautiful micrococcus colonies. Very little smell. The destruction of the intestinal elements by the micrococcus entirely similar to that in human intestine."

The result of Dr. Hallier's investigations may then be summed up to be: The finding of a new stage of growth of a world-wide fungus in the stools of cholera and the production of this (from other forms of the species) *out of the body* by means of heat. His *surmises* are that this growth destroys the epithelium by a purely local action, thus producing cholera, and that the reason that India is the home of the cholera is because its climate is a hot one! Surely any one will agree with him in believing the question, "Is the cholera fungus identical with the cholera contagion?" unanswered!

If the cysts are the cause of cholera, and his experiments of their production out of mucor, by cultivation at a high temperature, be confirmed, any one possessing a little knowledge of the fungi can generate the cysts at pleasure, and by throwing them in mid-summer into the water-basins from which cities are supplied, spread far and wide the terrible destroyer! But as yet it is not probable that his surmises are correct. The mucors or moulds are world-wide in their distribution. They follow in the wake of civilized man, if they do not precede him, as closely as wheat and corn, or the thistle and mullein. It is scarcely possible that a species found all through Europe, and in China and India, should not exist in South America or northern Africa. Why then is not cholera endemic in Algeria, the West Indies, or Brazil, especially why has it not remained there, having been introduced, if heat and moisture be the climatic conditions required for the propagation of the plant which is its essential cause? Further, it seems impossible to account for the symptoms of cholera, under the supposition of a local affection of the bowels. In the ordinary cases, preceded by cholérine, it is imaginable that a rapid destruction of the epithelium of the alimentary canal could cause all the trouble, but how is this possible in the cases of sudden collapse with all the ordinary symptoms of "blood-poisoning." Before this explanation of the origin of cholera can be accepted, there must, it seems to us, be unimpeachable testimony of the production of the disease by the swallowing of urocysts, obtained independently of the cholera stools by the method recommended by Dr. H.

But the Doctor carried his researches further than has as yet been indicated. He was convinced by the appearance obtained in his successful production of the cysts that they belonged to the family of the Ustilaginei, and even to the genus urocystis. This genus grows in the young, highly nitrogenized tissue of grasses, hence the probability of the cholera-cysts also developing in such situations. In an old work by a Dr. Tytler, the cholera has received the name of the *morbus oryzeus*, and other observers in India have also noted a connection, in time at least, between disease of the rice and an unusual prevalence of cholera. Led by these and similar facts, Dr. H. tried the following experiment. A number of rice seeds were sown on the 2d of June, and watered with the cholera stools. They stood in a window looking towards the south at a temperature of from 16°

to 20° R. They were kept very wet. On the 11th of June they were all up above the ground. The plants appeared entirely healthy.

"Their longitudinal sections showed that at the upper end of the root, and immediately above their point of junction (*ansatzpunkt*), tender, bright, fungal threads had bored through the epidermal cells in great numbers. They had already penetrated deep into the inner thin walled parenchyma, where they wandered from cell to cell, also using the intercellular spaces for passages. In the cells, which they had bored into, was the tender protoplasm shrunken together and coarsely granular. When placed in glycerin there appeared in the cells great quantities of cryptococcus. I had proven before this that *Urocystis occulta* Rab. was accustomed to force its way similarly into the wheat seedling, and inside of the cells to produce cryptococcus."

The objection to this experiment is simply the fact that a very large proportion of plants grown out of their natural position in this way, and especially when kept very wet and watered with highly nitrogenized liquids, are infested with similar fungi. "Naturally," says the experimenter himself, "this result proves in no way that the tissue fungus is identical with the cholera cyst-plant, much less that it will develop the cysts anywhere upon the plant. The fact, that after the sowing of rice with the cholera stools a fungus is found in the seedling, is however sufficiently important not to remain unnoticed here." This most careful and elaborate investigation, by one well prepared by previous study, has therefore failed to prove, or even make probable, the existence of a plant which is the cause—not accompaniment—of the cholera, and by such failure affords good ground for believing that no such plant exists. The results of feeding the cholera stools to animals have been perplexingly various. According to the London *Lancet* (vol. ii. 1867, No. xvii. p. 532), Dr. Sanderson has shown by his experiments that the addition of a minute quantity of the cholera stools to the food of mice produces in them a very fatal malady. The points of especial interest in connection with Dr. Hallier's investigations are, that those experiments made in the month of November yielded negative results only, which, observes Dr. Sanderson, "can scarcely be attributed to any other circumstance than the comparatively low temperature that then prevailed; for in every other respect the conditions of the experiments were identical." Again, "there were also throughout the intestinal tract vast numbers of low vegetable organisms; along with *Bacteria* and rod-like bodies, resembling *Oscillatoria*, both of which possessed an active molecular motion, there were occasionally found filaments and spores of fungi." Where were the urocysts? On the other hand, it is said that in a great number of experiments by Drs. Snellen and Miller at Utrecht, Drs. Stokvis and Guye at Amsterdam, Drs. Guttman and Baginsky at Berlin, large numbers of lower animals of various genera and orders were fed freely on the excreta of cholera patients without bodily detriment. From these results as well as from the experience of the directors of the Zoological Gardens at Rotterdam and Amsterdam, Drs. Snellen and Miller conclude that cholera is not communicable to the lower animals. "This is not the place to discuss the question of the contagiousness of the Indian pestilence, but in view of all the facts that have been stated, it does not seem too much to assert that in the present state of our knowledge, we have no sufficient evidence to prove or even render probable that cholera has its origin in any of the cryptogams.

H. C. W. Jr.

ART. XIX.—*Hospitals and Hospital Construction.*

1. *Étude sur les Hôpitaux considérés sous la Rapport de leur Construction, de la Distribution de leurs Batiments, de l'Ameublement, de l'Hygiène, et du Service des Salles de Maladies.* Par M. ARMAND HUSSON, Directeur de l'Administration Générale de l'Assistance Publique. Paris, 1862.
2. *Rapport sur les Hôpitaux Civils de la Ville de Londres au point de vue de la Comparaison de ces Etablissements avec les Hôpitaux de la Ville de Paris.* Par M. BLONDET, et M. S. SER, de l'Administration de l'Assistance Publique. Paris, 1862.
3. *Sixth Report of the Medical Officers of the Privy Council, with Appendix, 1863.* London, 1864.
4. *Projet de Construction du Nouvel Hôtel-Dieu de Paris. Rapport fait au Conseil Municipal de Paris.* Par AMBROISE TARDIEU. pp. 44. Paris, 1865.
5. *Plain Concise Practical Remarks on the Treatment of Wounds and Fractures; with an Appendix on Camp and Military Hospitals, principally designed for the Use of Young Military and Naval Surgeons in North America.* By JOHN JONES, M. D., Prof. of Surg. in King's College, New York. New York, 1775.
6. *Medical Sketches of the Campaigns of 1812, '13, '14; to which are added Surgical Cases, Observations on Military Hospitals, and Flying Hospitals attached to a Moving Army.* By JAMES MANN, M. D., A. A. S., &c. pp. 318. Dedham, 1816.
7. *Société de Chirurgie de Paris; Discussion sur l'Hygiène et la Salubrité des Hôpitaux.* pp. 137. Paris, 1865.
8. *Notes on Hospitals.* By FLORENCE NIGHTINGALE. Third edition. pp. 187. London, 1868.

IN the first lines of the preface to her admirable work, *Notes on Hospitals*, Miss Nightingale remarks: "It may seem a strange principle to enunciate as the very first requirement in a hospital, that it should do the sick no harm." It does, indeed, seem strange that in this day of the universal recognition of the necessity of hospitals, and their rapid multiplication, an able and experienced writer should solemnly and emphatically assert, as the first principle in their construction, the simple and unquestioned axiom, that they do the sick no harm. Is it really true that, after centuries of experience, we have become so regardless of the true purpose and intent of hospitals that we need to be admonished of the real object of such institutions? Must we be reminded anew that hospitals are designed for the cure of the sick? Whoever views this subject in the light of experience and observation must acknowledge that Miss Nightingale has stated a truth which even now is full of significance, and deserving of the most serious consideration. It is too true, as she remarks, "that the actual mortality in hospitals, especially in those of large crowded cities, is very much higher than any calculation founded on the mortality of the same class of diseases among patients treated out of hospitals would lead us to expect." This is especially the case with those diseases classified under the general head of typhoid; as erysipelas, pyæmia, continued fevers, diarrheal affections, etc., most of which are now understood to arise from, or be aggravated by, local causes. All large metropolitan hospitals always show an excess of deaths from these diseases. But it is not only by delay-

ing the recovery of the sick that hospitals fail to answer their humane purposes; they may, by their unhealthiness, expose their inmates to new and fatal diseases. There are many instructive examples of this latter defect in our hospitals. Indeed it is not an infrequent occurrence that patients enter general hospitals with simple and curable diseases, but contract other maladies of a more fatal character, of which they die. The aggregate mortality of this class from fever and typhoid affections, in large hospitals, is not inconsiderable. Every lying-in ward, and, in fact, nearly every ward of general hospitals, affords striking proofs of this statement. Every life thus sacrificed is needlessly and criminally destroyed.

Hospitals were instituted at an early period, and were at first united, for the most part, to monasteries, and were essentially religious organizations. It was not until the twelfth century that they began to assume much importance, and take a proper rank as public institutions. But even then no especial attention seems to have been given to their construction and management. The style of architecture was adapted to that of the age in which they were built, with but little regard to the special purposes of the building. Hospital endemics were of constant occurrence, and so great was the annual mortality, even of the best hospitals, that these institutions came to be characterized by the most disparaging epithets. It was not until near the close of the last century that any enlightened discussion occurred as to the causes of this excessive mortality, and that an adequate remedy was suggested.

One of the first students of an improved hospital construction was an American surgeon. To Dr. John Jones, of Revolutionary memory, the friend and professional adviser of Washington and Franklin, belongs the honour of *first* advocating and practically demonstrating an improved system of hospital construction and management. His attention was called to the subject while pursuing his studies in Europe, about the middle of the last century, and his observations upon the condition of the great hospitals of Paris and London show how thoroughly he appreciated their defects. In the work above quoted he says—

“To those who are unacquainted with the subject in question it will, doubtless, appear a very extraordinary assertion that there is not at present in the capital of the kingdom (London) a single hospital constructed upon proper medical principles. * * * *

“In Paris it is supposed that one-third of all who die there die in hospitals. The Hôtel-Dieu, a vast building situated in the middle of that great city, receives about twenty-two thousand persons annually, one-fifth of which number die every year. It is impossible for a man of any humanity to walk through the long wards of this crowded hospital without a mixture of horror and commiseration at the sad spectacle of misery which presents itself.”

He concludes that the excessive mortality in hospitals of large cities as compared with those of small towns is due to overcrowding and defective ventilation, and makes the following very pertinent remarks :—

“A false economy has universally prevailed in the structure of hospitals for the sick; for those that have hitherto had a principal direction, both in the architecture and management of them, have confined their views entirely to objects of convenience, cheapness, and ornament. * * * *

“In short,” he says, “the physician and architect have, generally, two very opposite and incompatible views; the latter laying out his plan so as to contain the greatest number of persons in the least possible space, whereas the former always aims at having the utmost room which is consistent with use and convenience.”

It will ever redound to the honour of this distinguished surgeon, not only that he correctly interpreted the faults of hospital construction at that early period, but that he devised plans for the old New York Hospital upon the pavilion model, and secured its construction with all the appointments of the most approved hospitals of our time. This hospital was begun in 1771, and was burned, when nearly completed, in 1775. He says of its architecture—

“It is to be hoped that the hospital lately built in the city of New York will have fewer objections to its plan than any hospital hitherto constructed; the principal wards, which are to contain no more than eight beds, were thirty-six feet in length, twenty-four wide, and eighteen high; they are all well ventilated, not only from the opposite disposition of the windows but proper openings in the side walls, and the doors open into a long passage or gallery thoroughly ventilated from north to south.”

At a somewhat later period the subject of improved hospitals began to attract attention in France. And it is interesting to notice that those who wrote upon this subject made their first observations, like Dr. Jones, in the Hôtel-Dieu, and arrived at nearly the same conclusions as to the remedy.

The ancient Hôtel-Dieu of Paris, one of the oldest European hospitals, had long been notorious for its excessive mortality. It was so arranged that there was direct communication between the wards occupied by five hundred and fifty patients. The whole number of beds was twelve hundred, but this by no means measured the capacity of the hospital; by crowding, these beds were made to accommodate two thousand, five thousand, and even seven thousand sick people. In 1515, the multiple beds contained eight to twelve patients each; in 1530, there were relays of patients to each, those not in bed waiting their turn on forms. In 1772 this hospital was burnt, and with it a number of patients, and public opinion demanded its removal. After much discussion a commission of the Academy of Sciences was appointed to consider the questions raised as to the removal or reconstruction of the Hôtel-Dieu. This commission embodied some of the most eminent names in the scientific world, as La Place, Lavoisier, Bailly, Daubenton, &c. The problem presented to these practical minds, and the data given for its solution, were of such a character as to call forth all their energy. They submitted their final report in 1788, embracing principles and plans for the reconstruction of Hôtel-Dieu.

The groundwork of the reform which they proposed was, first, the separation of the sick from the administration; second, the exposure of the wards to the currents of air, and to the sunlight; and, third, a larger surface area and cubic air space to the individual patient. In these three propositions we have embodied the true principles of hospital construction, and all the discussions of modern times, and all experience and observations have only the more confirmed and established them.

In the detail of their plans of reconstruction of the Hôtel-Dieu the commission describe in nearly exact terms the plan of the Lariboisière Hospital of Paris, the most perfect of modern hospitals as regards its general plan.

During the war of 1812 the subject of hospital construction attracted much attention, and Surgeon-General Tilton proposed what Dr. Mann very correctly terms “a novel plan.” Hospitals were to be built of logs, one story, without floor, a fireplace without chimney in the centre. Hospitals constructed on this plan were found to be expensive, and they were built to but a very limited extent. Dr. Mann’s own plan of hospitals is much better. He proposed to have them one story; the wards accommo-

dating 20 patients, 24 × 30, and 11 feet high, with east and west exposure; a covered corridor 12 feet wide, &c. This plan gave but 396 cubic feet of air space to each patient, and effectually closed one side against all ventilation. It is evident that little improvement in hospitals had been made in this country from the Revolution to the second war with Great Britain.

For the succeeding half century but little attention was given to improvement in hospital construction and management. The principles laid down by the commission of the Academy of Sciences of Paris seem to have attracted no notice and to have found no expression. In 1846 the establishment of the Lariboisière of Paris, was decided upon, and the plans of the commission were reproduced, and in the main followed. This hospital represents an era in the science of hospital construction. Whatever may be its defects they are due rather to faults in detail than to original principles, and cannot militate against the grand idea which underlies it.

It is not a little remarkable that within the last year or two the question of reconstructing the Hôtel-Dieu has again been raised, and the whole subject of hospital construction has been thoroughly canvassed by the *Société de Chirurgie* of Paris, resulting in a confirmation of the report of the Academy of Sciences of 1788.

In Germany great interest is now manifested in hospital construction. The work of Dr. Oppert, of Berlin, embodies the most approved views.

In Great Britain the highest order of architectural talents is now devoted to this subject, and with the best results. The fearful mortality which resulted from the agglomeration of the sick in the Crimea in ill-constructed barracks, and the great improvement which followed the introduction of well-arranged and properly appointed hospitals stimulated inquiry into hospital construction. In this inquiry Miss Nightingale took the lead, and it is mainly due to her startling developments of the causes of this terrible mortality, viz., hospital mismanagement; and the fervor of her appeals in behalf of improved hospital construction and management, that practical minds both in and out of the medical profession have recently given to this subject so much thought and study. And to her work on hospitals, more than to any or all other sources, is the world indebted for the magnificent hospital system now universally recognized, which is giving to the sick-poor retreats so beautiful, so pleasant, and so healthy.

In this country the subject of improved hospital architecture has not attracted much notice until recently. All our modern hospitals are constructed upon old plans, and give the same unfavourable results in practice. The first systematic effort to establish a hospital in accordance with the demands of sanitary science was made by the municipal government of Boston, Massachusetts. In establishing a free city hospital, in 1861, the authorities advertised for plans, and a large number were submitted. From these they selected one which carries out to the fullest extent the latest and most improved ideas of hospital construction, viz., the pavilion plan. More recently the Commissioners of Emigration of New York have erected upon Ward's Island a large hospital arranged in pavilions. At Providence, Rhode Island, a third hospital is being constructed upon the same plan, as is also the German hospital of New York, now being built, and several other hospitals projected in various parts of the country.

During the war just closed great attention was paid to the erection of suitable military hospitals. All of the hospitals erected were upon the pavilion plan, and admirably did they answer their purpose. At one

period there were not less than two hundred general hospitals under the medical department of the army, accommodating from two hundred to four thousand patients each. To Dr. William A. Hammond, then Surgeon-General, is due the honour of introducing and enforcing the latest improvements in hospital construction. The country owes him a lasting debt of gratitude for the enlightened zeal with which he administered, often under great embarrassments, this department of the army medical service.

The views at present entertained of the principles of hospital construction may best be stated by examining in some detail the more important questions involved in the erection of a hospital. On these points the above works are more or less complete, and we shall limit this review to the statement of the general conclusions therein contained.

The first question which those engaged in the establishment of a hospital have to consider is the location. Shall it be located in the city or country? Much attention has recently been given in England to the comparative healthfulness of hospitals located in populous towns and in the open country. Statistics of mortality from these different institutions have been collected and compared, and various deductions have been drawn therefrom. In 1863 the question took a thoroughly practical form, and the results of the investigation are worthy of the most serious consideration.

St. Thomas' Hospital, which had for six centuries occupied a position at the south end of London Bridge, was about to give up its ancient site, and seek a new location. A contest immediately arose among the parties interested in the hospital, some contending that it should seek a purely country location, while others were 'equally strenuous in their efforts to secure a site not far removed from that which it was about to abandon. It was alleged by the first party that the great desideratum in the location of a hospital was the selection of a site far from the pollution of a city atmosphere, and abundantly supplied with pure air. The second party contended that the value of a hospital depended upon its accessibility by that class of sick persons for whose relief it was erected; if, therefore, a hospital designed for any class of people living in a populous town should be located at a distance in the country, whatever advantages it might have in salubrity, it would be of little or no service to those who were expected to occupy its wards.

The question became a matter of so much public interest that the Privy Council appointed a commission to examine critically the hospitals of Great Britain, Scotland, and France, with a view to determine definitely the comparative mortality of city, town, and country hospitals, and "to ascertain the influence of different sanitary circumstances in determining (in different hospitals, as compared with one another and where practicable, with private practice) the more or less successful results of medical and surgical treatment."

After a most careful and searching investigation the commission came to the following conclusions:—

"English rural hospitals have acquired, on false grounds, a reputation for comparative healthiness; by their regulations, their practice, or their position, they receive habitually a far less serious class of cases than is admitted into the hospitals of London and other large towns; this difference in the quality of the practice is much greater in respect of medicine than of surgery, but is considerable even as regards surgery; the result is marked lowness of death rates, even, in many cases, in the presence of a high degree of hospital insalubrity."

In giving their conclusion a practical application they make the following statement:—

"Suppose it possible to transport St. Bartholomew's Hospital, as it now is, and with its present supply of patients, from the heart of the city into the heart of the country, what would be the result on the prospects of individual patients? Our deliberate opinion is that the effect, if any, would be trifling. That there might be some slight variation in the mortality may or may not be probable; but that the prevalence of hospital disease would be much decreased, that operations on given cases would be more likely to succeed, or that the period of recovery of given cases would be much abridged, we do, judging from the evidence before us of the state of things in hospitals variously circumstanced, as far as situation goes, utterly disbelieve. In fact, we have no evidence which shows that any change would be wrought in any of these three particularly."

Notwithstanding the high authority and positive conclusions of this commission, its decision, so contrary to all experience and belief, is not to be accepted as final. A careful examination of the report and the statistics which form its groundwork, cannot fail to convince the reader that the evidence adduced is after all not satisfactory. It is for the most part of a negative character; there is wanting that perfect analogy in comparison essential to positive results. It cannot be denied that the country has the purer atmosphere, the greater facilities for drainage, a better exposure to sunlight and to winds. It is only in the danger of unhealthy emanations from the soil that the city has preference over the country; but even in this respect there is a full compensation on the part of the city in the poisonous effluvia from the streets, sewers, and unclean courts.

Happily it is a matter of little consequence how we decide the question of the comparative healthiness of city and country hospitals, for another element of equal importance to salubrity must enter into our calculation in selecting a site, viz., accessibility.

No fact has been more rigidly demonstrated during the late war than that transportation of acute, medical, and surgical cases is, in a given degree, injurious. A hospital to be in the highest degree serviceable must be located near that class of people whom it is designed to benefit. In the erection of hospitals for small towns a country site may readily be selected which will not place the hospital beyond the limits of easy transportation. But it rarely happens, that in the selection of a site for a hospital intended for the treatment of the acute diseases of any class of people of a populous town, salubrity and accessibility so exactly correspond as to leave nothing to be desired. One or the other of these conditions must take precedence, and we are sustained by the united testimony of the ablest writers on hospital construction in the statement that the former must, to some extent, be sacrificed to the latter.

Says Miss Nightingale, a strenuous advocate of country hospitals, when it is practicable to properly locate them—

"It is, obviously, of no use to build a hospital in the best air in the world if neither patients nor medical officers can get to it. It is only in applying common sense to such a question, and by always giving a preponderance to the condition of highest importance, namely, pure air, when other conditions can be at the same time reasonably obtained, that the best will be done for the sick."

* * * "All are agreed that fresh country air is better for the sick than impure town air, and hence the whole question narrows itself within the compass of one of the conditions enumerated above, namely, accessibility."

The medical officer of the Privy Council, Mr. Simon, in commenting upon the report of the commission of inquiry into the salubrity of English hospitals, remarks:—

Primarily the site of every hospital must be decided by the site and distinc-

tion of the population to which it has to minister; and if, as too commonly happens, reasons of trading, convenience, or other reasons have determined a population to settle itself in a site of comparative insalubrity, the hospital which has to minister to that population can seldom do otherwise than to some extent share the same lot. All that it has then to do is to make the best settlement which is possible within the limited area of choice."

When the question of the removal of the site of St. Thomas's Hospital, London, was first raised, its Board of Governors sought the advice of its medical officers as to "whether town or country should be preferred for the new hospital site." Though these gentlemen were divided in opinion on the general question of the comparative healthiness of country and town hospitals, they advised in the following terms:—

"Supposing two otherwise thoroughly well-conditioned hospitals, one in London, the other in the country; some of us believe, while others of us do not believe, that in the results of medical and surgical treatment the country hospital would have an appreciable superiority of success. If, however, we, in this respect for argument's sake, adopted, as though it were unanimous, the most sanguine belief which any one of our members entertains, our practical conclusion (that St. Thomas's Hospital ought not to be moved into the country) would be unchanged; for unanimously we should be of opinion that the advantages of the country hospital would be purchased at far too dear a price, when, in obtaining them, the hospital must be made inaccessible to the sufferers who most urgently require it, and when the present system of professional attendance must be changed in essential particulars."

It is interesting to notice in this connection the final action of the governors of St. Thomas's Hospital. Although a sub-committee of their own number reported in favour of selecting a rural site, and removing the hospital beyond the city limits, their conclusions were rejected by the full Board, and the hospital has been re-located within convenient distance of the district of London, the population of which it serves.

The bearing of these facts upon the question of locating a hospital designed for the relief of acute, medical, and surgical cases occurring among any part of the population of large cities, is important. A hospital located *beyond* the corporate limits of the city could not, in many instances, be available for the treatment of acute disease occurring among any class of its people. If such a hospital were, indeed, located in the adjacent country, it would require a house of reception in the city for severe cases, and this latter would soon become the more important institution, while the former would gradually assume only the status of a convalescent hospital.

It being determined, therefore, to locate the hospital within the city limits for the purpose of rendering it accessible, we have a not less important question to decide than that already considered, namely, the selection of a proper site with a limited means of choice. As, however, the area of many large towns of this country presents every variety of hill, valley, and plateau, and, further, the city railroads render most of this territory readily accessible, this problem of selecting a proper location within the town limits admits of a comparatively easy solution. A site can be chosen, and doubtless secured, which will for a considerable period present equal advantages with the best country location as regards pure air, abundant ventilation, and unobstructed sunlight. St. Luke's Hospital, New York, the Episcopal Hospital, Philadelphia, and others, have for several years enjoyed all the advantages of a country location, and are accessible to the sick-poor. It must be remembered, however, that within a given, but not remote period, every available portion of the area of most

of our large towns is to be occupied by a dense population, and care should be taken to secure a sufficient amount of land to prevent such encroachments as in time would seriously impair its location.

The immediate choice of a site should be governed by its accessibility, the future character of the neighbourhood, its elevation, its soil, its facilities for surface and underground drainings, the amount of land purchasable, etc. Care should be taken to guard against the neighbourhood of unwholesome establishments, as fat boiling, slaughter-houses, gas-houses, etc. Elevated grounds should be chosen, not only for greater purity of air, but for better facilities of drainage and sewerage. A soil should be selected porous and non-retentive of moisture; hence, clay soil should be avoided. Perfect sewerage and drainage is an absolutely essential condition in the groundwork of a hospital, and to secure this advantage there must be proper descent for a rapid discharge and removal of sewage. It is of prime importance also to guard against future encroachments of population or business, and therefore a sufficient amount of land should be obtained to preserve to the hospital the free circulation of air and unobstructed sunlight.

Mr. Simon (op. cit.), remarks :—

“Where the hospital is for a town, sites must be compared with special regard to their respective degrees of spaciousness and ventilability; and in order to get more of those advantages, so far as the pursuit of them consists with the due accessibility of the hospital, preference commonly ought to be given either to the outskirts, or to the largest interior spaces of towns. Except for special reasons to the contrary, hill-tops are to be preferred to hill-slopes, and either of them greatly to valley-bottoms. And the cleaner the neighbourhood the better.”

In selecting a site for a hospital within the corporate limits of towns, it must be constantly borne in mind that at no very distant day such hospital and grounds are to be enveloped in a dense and overcrowded population. The New York Hospital, and, to some extent, the Pennsylvania Hospital, in Philadelphia, originally located far from the centres of business, in the free and open country, but still on the line of city growth, present examples to which we should give heed. On every side, business with covetous grasp presses upon them, and these once quiet and secluded precincts are for evermore disturbed by the roar and din of traffic, and the atmosphere is polluted by the emanations from the crowded tenements, and the unclean courts and streets. Invaluable as have been and are the services of these noble institutions to the unfortunate of the large territory which surrounds them, there can be no doubt that their future success would be much greater could they command a large open area upon all sides.

In the location of recent town hospitals, the Boards of Governors and Trustees have been properly impressed with the importance of securing an ample amount of grounds. The trustees of the Free City Hospital, Boston, secured six acres and seven-tenths, and remark :—

“We consider the dimensions of this area none too large, and quite consistent with a judicious economy. * * * The importance of open spaces for light and the free circulation of air from the water is too obvious to dwell upon, and we think there can be but one opinion as to the propriety of securing, while in our power, all the area that we need.”

The Rhode Island Hospital, Providence, has an area of fifteen acres.

The Episcopal Hospital, Philadelphia, erected on high ground in the suburbs of the town, secured two squares of six acres each, amounting to twelve acres.

The Lariboisière Hospital, Paris, occupies twelve to fifteen acres.

The New Herbert Hospital, Woolwich, England, has an area of seven acres for seven pavilions.

The New St. Thomas' Hospital, London, is to occupy fifteen to eighteen acres, having seven pavilions.

The German Hospital, New York, has secured one square, and propose to add several lots on an adjoining square.

Much attention has recently been given to the capacity of civil hospitals in its relation,

1st. To facility of administration, and

2d. To the effect of the aggregation of sick upon the mortality.

The true objects to be obtained in administration, are economy and efficiency. To secure these ends, much will always depend upon the character of officers and subordinates, whatever may be the peculiarity or perfection of the hospital arrangements. Fonblanque truly observes, "It is not the *personnel*, but the *morale*, upon which a sound administration hinges; a system based on the personal integrity of its agents." But it is nevertheless true, that the appointments of a hospital may be so imperfect that the greatest vigilance and energy on the part of agents shall not secure a high, or even a moderate degree of either economy or efficiency.

The first element of failure in hospital management, is due to a too-extended jurisdiction. The larger the number of patients, the greater the number of details and the more complicated the system. Beyond a certain limit the machinery becomes cumbersome, and ceases to feel the momentum of the central, governing power. Wastefulness succeeds to economy, tardiness to promptness, recklessness to efficiency. We conclude, therefore, that for economical and efficient administration a limited capacity is essential, and in this we are borne out by experience. And we should reach the same conclusion, did we have regard to the effect of the aggregation of sick persons upon the health of the hospital. If proper hospital management requires a certain fixed area populated by a fixed number of sick, any increase of that number must tend at once to the vitiation of the atmosphere of that area, and sooner or later seriously affect the healthiness of the place. Miss Nightingale very truly remarks:—

"It is a well-established fact that, other things being equal, the amount of sickness and mortality on different areas bears a ratio to the degree of density of the population. Why should undue agglomeration of the sick be any exception to this law? Is it not rather to be expected that the constitutions of the sick people being more susceptible than those of healthy people, they should suffer more from that cause?"

Observation and experience coincide in establishing the fact that civil hospitals having not more than six hundred and fifty patients under one management, are best conducted so far as regards strict economy and real efficiency. And a due regard to the effects of the aggregation of the sick upon the health of a hospital confirms the proposition. If an extreme approved limit were required, we should fix it at one thousand patients. For, as Miss Nightingale says, when the machinery begins to multiply itself, it becomes unwieldy.

The governing principle in hospital construction, until a recent period, was the arrangement of the wards and buildings around a central stem or axis which became the medium of ventilation. This central shaft was either a staircase or a series of corridors, or, finally, a chapel. In the elaboration of this idea we obtain all the variety of plans which characterize the older hospitals.

The first and most prominent defect in all these plans is the utter impossibility of securing thorough ventilation. Through the medium of the stairways and corridors wards are directly ventilated into each other, and the air of one contaminates the other. Besides, too frequently, these central shafts have no special means of independent ventilation, and hence become great reservoirs of foul air. It is perfectly certain that in time the air, and even the walls, of such hospitals must become saturated with the poisonous emanations of the sick, and react most unfavourably upon the inmates. It is to this source that we must trace hospital endemics, such as pyæmia, erysipelas, diarrhœa, typhoid and typhus fevers, which are so rife and so fatal in older hospitals.

Another defect noticeable in these plans is the tendency to surround the wards with many of the accessory rooms, thus shutting them still more within the central portion, and depriving them of proper external means of ventilation.

Again, these plans lead to an excessive aggregation of the sick upon a given area. Stories are superadded and wards multiplied until the population to the surface-area exceeds many times a proper standard. All the evils of overcrowding; one of the most potent sanitary defects of towns, are realized, often in a fearful degree, in many of the older hospitals. All hospitals of this construction are not by any means equally faulty; many of them, indeed, by unusual extension and great care in preventing overcrowding maintain a fair degree of salubrity. But sooner or later, without exception, they give rise to some of the pernicious hospital endemics already mentioned, and demonstrate beyond question that the air within is becoming charged with impalpable and imperceptible miasms.

The fault is in the groundwork of the plans; they do not provide for the constant and thorough removal of foul air, and an abundant supply of fresh air. Mr. Robertson, of Manchester, a scientific expert in all that pertains to hospital construction, says that such hospitals labour under:—

“First, the difficulty, owing to faulty construction, of securing a free circulation through the wards and continued renewal therein of the external atmosphere; and, secondly, the intimate connection existing between the different wards in each story by means of doors and passages, and between the different stories by inside stairs—an arrangement which favours the rapid diffusion over the house of the foul air continually being generated in every one of the wards, and the creation consequently of a hospital miasm.”

Miss Nightingale says:—

“One of the most common mistakes in hospital plans, even in some of the most recent of those I have seen, is mixing up together, in the same block, sick wards and administration offices of all kinds. It need hardly be pointed out that such an attempt must necessarily lead to a very complicated structure, containing large wards, and an indefinite number of rooms of different sizes, all connected by passages and stairs more or less dark, badly ventilated, and diffusing a common atmosphere throughout the building.”

The all-important question which presents itself to students of hospital architecture is, how can these original defects in construction be remedied? The Committee of the French Academy of Sciences, appointed to report a plan of rebuilding the Hôtel-Dieu, already referred to, met this question and gave it a practical solution as early as 1778. But little improvement, except in details, has been made upon their plans during the past three-quarters of a century. It will be instructive therefore to notice briefly some of the leading points of their report.

1st. They proposed the isolation of the patients from the administration by the erection of separate and independent buildings.

2d. They proposed that a building for the reception of patients should be located in the front ground; the administration buildings, containing the offices, kitchen, apothecary's department, &c., in the centre, and the pavilions at the extremities.

3d. They proposed that the pavilions should be parallel buildings, three stories in height, 24 feet wide by 168 in length; the ends of the buildings to the extent of 30 feet were to be wider, and contain all the accessory rooms of the wards; the height of the wards was to be 14 to 15 feet; the windows were to be placed above the beds and extend to the ceiling.

4th. They proposed that each ward should contain 34 to 36 beds, each pavilion 102 to 108 beds, and that each individual ward should have its baths, its latrines, its kitchen, its stove, its scullery, and every convenience for the care and comfort of the sick, making each ward, in fact, an independent hospital.

5th. They proposed that the pavilions should be separated 60 feet; the intervening space being occupied as a garden without trees or shrubs, lest the air should be intercepted, and to be used as a promenade for patients.

6th. They proposed that the pavilions should be connected by a corridor, but this corridor was not to be elevated above the basement, lest it should intercept the free circulation of air.

In these several propositions we have the germ of true reform in hospital construction. They have been approved by the highest authority both among architects and medical men in Europe and America, and are finding expression in all the hospitals now in process of erection.

"By a hospital pavilion," says Miss Nightingale, "is meant a detached block of building, capable of containing the largest number of beds that can be placed safely in it, together with suitable nurses' rooms, ward sculleries, lavatories, baths, water-closets, all complete, proportioned to the number of sick, and quite unconnected with any other pavilions of which the hospital may consist, or with the general administration offices, except by light, airy passages or corridors. A pavilion is indeed a separate detached hospital, which has, or ought to have, as little connection in its ventilation with any other part of the hospital as if it were really a separate establishment miles away."

If the pavilion plan is rigidly carried out it will be seen that all the serious defects of the older hospitals will be remedied. The aggregation of the sick upon a given surface-area may be reduced to its minimum, and cubic air space may be increased to its maximum; the most simple and natural ventilation may be adopted for the wards; water-closets, latrines, bath-rooms, and other accessory rooms may be so isolated as to avoid all sources of impurity. Infectious and contagious diseases may be separated from the wards, containing other affections, so effectually that no communication is possible. The administration, with all its noise and sources of impurity, is entirely separated and forms a distinct and independent department.

Another, and not unimportant advantage of the pavilion plan, is its susceptibility to expansion and contraction. In its original construction, as few or as many buildings may be erected at first as is deemed necessary or expedient, and subsequently other buildings may be added as they are required. Again, the buildings being erected, any one may be vacated, cleaned, or repaired, without in the slightest degree interfering with the hospital management.

It has been alleged against the pavilion plan that it is necessarily very

expensive. It is true that this form of hospital requires a large surface area, and hence more ground is necessary. And it is equally true that more buildings are needed for the separate and isolated pavilions, with all their appointments of rooms for the complete and independent service of each ward. Judging also of the comparative cost, of the pavilion and an ordinary single-block hospital, by those hospitals of each class already completed, we should, in the absence of the special facts in each case, conclude that pavilion hospitals are vastly more expensive in their construction. For example, the Lariboisière Hospital, Paris, for 650 beds, cost 6,655,215 francs, or upwards of a million and a half dollars. New St. Thomas' Hospital, London, for 588 beds, is estimated to cost £360,000, or about \$1,800,000. The Herbert Hospital, England, is estimated to have cost a corresponding sum. The Free City Hospital of Boston, consisting of but two pavilions, and accommodating 225 beds, cost upwards of \$300,000. The Emigrant Hospital, Ward's Island, 250 beds, cost between \$300,000 and \$400,000. In the instances of the two latter hospitals the expense is independent of the grounds.

On a critical examination, however, of the circumstances under which these several hospitals were built, we find a proper and sufficient explanation of the large expenditure of money in each case. Several were built at the expense of municipal corporations, and hence there was but little regard paid to economy. Others were built by wealthy organizations, which were equally lavish with their funds. In nearly all, the style of architecture was the most expensive that could be adopted, requiring extravagant ornamentation.

That pavilion hospitals may be so constructed as to give all the advantages of the plan their fullest development, with a reasonable and proper amount of artistic finish, without involving such an extravagant outlay of money as the above examples would indicate, we believe entirely possible. A large proportion of the excess in expenditure is due to architectural accessories, most of which are positively injurious, and some of which are so arranged as to defeat the very purposes for which a hospital is erected. Such are large, massive, four or six-sided towers at the extremity of each pavilion, unconnected with ventilation—curiously constructed windows, elaborately carved and heavy wood work in the interior, etc. Most, if not all, of these attempts at architectural effect are not only exceedingly costly, but tend to defeat the real purposes for which a hospital is erected.

But we need not leave this matter to conjecture, for we have an example of a pavilion hospital, large and admirably arranged, which involved no larger expenditure than one of the most common of the older hospitals. Such is the Chorlton Hospital, England. The contract for five pavilions, including the corridor, was about £3000, or about \$15,000; or \$75,000 for the entire hospital, which is to accommodate about 300 beds. The architect observes: "I need not say that all attempt at architectural effect has been carefully avoided; but the work is substantial and good, and the main sanitary objects will be attained."

The plan of a Free City Hospital by Dr. Henry G. Clark, of Boston, is destitute of exaggerated architectural ornamentation, but still presents a neat and cheerful appearance, with all the necessary details to answer sanitary purposes. These buildings were estimated to cost \$20,000 each.

We are justified, therefore, in the assertion that a pavilion hospital may be erected at a cost not greatly exceeding the older hospitals, provided simplicity and utility guide us in the architectural designs.

The arrangement of the buildings on the plot of ground selected is a matter of the first importance. The Committee of the Academy of Sciences recommended that the pavilions should be parallel, sixty feet apart, and running east and west, so as to have one side exposed to the sun. Experience has indeed proved that the buildings should be arranged on parallel lines, but those lines should run north and south, so as to give an east and west exposure to the wards, and thus admit the sun upon both sides during the day. Miss Nightingale says "the distance between the blocks should not be less than double the height of the blocks." She adds: "A greater distance would be better; but this would involve a greater cost for land, and a greater distance to be traversed by the hospital staff." This distance of separation is not sufficient, in general, to insure proper exposure to sun and winds; and it is worthy of notice that the most recent hospitals, as the Chorlton, are built with 100 feet of separation.

Miss Nightingale, and other prominent English writers, contend that a pavilion should never have more than two stories, with the basement—giving but two wards to each. The Committee of the Academy of Sciences, however, recommend three stories, and no adequate reason has yet been given why three stories of wards may not be constructed, provided complete isolation is maintained, and the wards, water-closets, latrines, and stairways or other passages, have secured to them *separate* and *independent* ventilation. Mr. Simon (*op. cit.*) remarks:—

"The notion that a large general hospital cannot be healthy unless it is broken into so-called pavilions, each of which shall have but two stories, has not, I think, any sufficient foundation in facts."

When the plans of the Netley Hospital were under consideration, this officer was interrogated as to whether a hospital atmosphere was liable to be generated where a large number of patients were congregated under one roof. He replied:—

"If, by the above expression, it be meant that patients in clean, well ventilated, and not overcrowded wards, with separately well-ventilated passages and staircases, are apt to breed an atmosphere (which along passages, or through floors and ceilings, or up or down staircases, will be) dangerous to those under the same roof with them, I have no information which could lead me to accept the doctrine. * * * As regards wards kept as wards ought to be kept, I cannot conceive that the several clean items will make a dirty whole; and, so far as my present knowledge extends, I have every reason to believe that, subject to the qualifications I have stated, a given number of patients may dwell under one roof as safely as under several roofs."

The report of the Committee of the Privy Council sustains this opinion. They declare that the number of stories is a mere question of convenience, *provided* the individual wards are kept clean and thoroughly ventilated. No hospital atmosphere can then be generated prejudicial to the health of the inmates. It must be borne in mind, however, that upper wards are less accessible, and high buildings obstruct the air and sunlight.

For healthiness and facility of nursing, the number of patients to a ward has been, by common consent, estimated at about thirty. If we give to each patient the requisite surface area and air-space—that is, a surface area of 8 by 12 feet to each bed, and a cubic area of air of from 1500 to 2000 feet to each patient—the ward would be from 25 to 30 feet wide, 110 to 120 feet long, and 14 to 17 feet in height. The proportions here given are now almost universally accepted as the true basis of health and easy administration. The following table exhibits the proportions of a ward for thirty-two patients; the first column gives the proportions of

such a ward in the Lariboisière Hospital; the second, the proportions adapted to a larger cubical space, such as is given in the best English hospitals:—

Proportions of Wards.	Feet.	Inches.	Feet.	Inches.
Length of ward	111	6	128	0
Breadth of ward	30	0	30	0
Height of ward	17	0	17	6
Wall spaces between end walls and windows	5	0	6	4
Breadth of windows	4	8	4	8
Breadth of wall space between windows	9	2	11	4
Height of windows	13	0	13	6
Cubic space per bed	1760	0	2100	0

It is of great importance that each bed have the requisite surface area. This well-established principle should never be lost sight of, viz.: "Impure air, whether emanating from the person or the excretions, diminishes as the square of the distance." If this axiom is constantly borne in mind, one of the greatest sources of ward infection will be removed. Miss Nightingale states that "in round numbers the superficial area for beds should be not less than 100 square feet." As the surface area of the bed is from 21 to 24 square feet, it will be seen that an additional 50 square feet will separate the beds 10 to 12 feet, allowing a proper space at the foot. An English writer on hospital construction says: "Each bed should have a space of 8 feet on the average, with 12 feet between foot and foot; beds should be at least 3 feet apart."

The amount of cubic air-space to each bed, requisite for health, depends primarily upon the activity of the circulation of the air. Under ordinary circumstances, however, it is not difficult to fix the area of each bed for a constant supply of fresh air in a room having fixed conditions of ventilation. In this problem height of ceiling has an important place, for above a certain level the stratum of air is of no service to the patient. As an example, patients crowded into churches with lofty ceilings, and close windows, have been supposed to be remarkably well provided with hospital accommodations during the late war, while those in tents have been commiserated on account of their exposed condition. But time has proved the fallacy of these speculations; the church-hospital has rapidly generated the most virulent endemics, while the tents have remained free from these affections. It is now well established that the ceiling should not be more than eighteen nor less than fourteen feet high in a hospital having proper facilities for ventilation. The cubic air-space to each bed should not be less than fourteen hundred feet.

In the pavilion plan the medium of personal communication between the several buildings must be by passageways, or corridors. In the older hospitals the corridor was always incorporated into the building, and was generally a part of the ward arrangement. Its connection with the wards varied, in some being external to the ward, but communicating with it by windows, while in others it opened directly at either extremity into opposite wards. The corridor, therefore, not only served the purposes of a passageway, but it became an important medium of ventilation of wards, and great importance was secondarily attached to it as a ventilating shaft. It requires, however, but a moment's reflection to understand that in this arrangement the corridor rather embarrasses than aids the active ventilation of the wards. When running parallel with the ward, and communicating with it by means of windows, it becomes in fact a foul-air shaft, where the air stagnates, and frequently, by the diffusion of gases, this stratum of foul air again returns

to the ward. The corridor also, by communicating directly with two or more wards having deficient ventilation, allowed one ward to ventilate itself into another, and thus they became the means of a general contamination of the whole hospital.

In the pavilion plan this defect may be completely remedied. The corridor becomes the medium of communication between buildings, but stands independent of those buildings, and especially of the wards. But even this separation is not sufficient; the corridor should, like the wards, have a separate and independent ventilation, so that by no possibility can it become the receptacle of foul and stagnant air. This can only be effected by constructing it with arcades, so that it is entirely open upon either side.

If there are two stories of wards, the corridor should have but one story, with its basement. The basement should be low, and the story should be open by means of arcades. By this arrangement the most complete ventilation of the corridor is obtained, and there is no possibility of the communication of the air of one ward with another, through this passageway.

Another and important argument in favour of having the corridor with open sides is that the circulation of the air upon the grounds is left free and unobstructed. As the corridor connects the adjacent pavilions, it necessarily traverses the intervening plot of ground. If, now, the corridor is high and closed, it very seriously obstructs the circulation of air around the buildings and through the grounds. The result of this stagnation of air on the plot of ground between the pavilions is deficient ventilation of the wards when that ventilation is by means of windows, and, what is more serious, there must be established, by the diffusion of gases, a process of slow ventilation of one ward into another, one of the most serious defects of the older hospitals.

One of the greatest sources of impurity in older hospitals is the water-closet. Its location is generally so nearly in the centre of the block, that all its emanations pervade not only the adjacent ward, but also the whole building. The pavilion enables us not only to isolate the water-closet and urinal from the hospital, but also to effectually separate them from the ward, while they are still sufficiently near for all practical purposes. Even more, it enables us to provide them with a separate ventilation. These accessories to the ward should be placed at the end of the building furthest removed from other departments of the hospital, and, being supplied with an independent drain, all foul material is immediately conveyed from the grounds. The position of the water-closet also admits of thorough ventilation, independently of the ward or stairways. The water-closets and sinks should also be located in the extremity of the building opposite the entrance and nearest the external limits of the grounds. In their construction they should be placed along the outer wall, and separated by a well-ventilated vestibule from the ward. This may be effected in various ways, but the best plan is undoubtedly that given by Miss Nightingale, which very effectually answers the purpose of exclusion and thorough ventilation.

The proper place having been selected for locating the water-closet, the question recurs, What form shall it have? The bowl with a movable pan is always objectionable in hospitals, as patients will use them so much and so roughly that they soon get out of repair. The pan can, however, be dispensed with, provided there is a free flow of water, with an invariable downward current of air. The former condition can be secured by allowing the flow of the bath-room and scullery into the water-closet, and the latter, by connecting the soil-pipe with a heated shaft, as a chimney. In the lunatic asylum at Utica a strong downward current is created by the com-

paratively large size of the soil-pipe—which runs from the sewer below directly upward and opens above the roof—and the pressure of the atmosphere within caused by the fan. It is the opinion of Dr. Gray, the distinguished superintendent, a precise and accurate student of ventilation, that the downward current is solely due to the large size of the pipe, but we are disposed to attribute something to the pressure of the volume of air which the fan creates. In this admirably conducted institution the water-closets are arranged centrally in the block, the bowl standing out in the middle of the closet, without any surroundings, and yet there is not the faintest foul odour perceptible, though fecal matter may be present on the sides of the bowl. This seems to be the perfection of water-closet arrangements, and cannot be too strongly recommended where downward ventilation can be secured. In general, the common trough with a large outlet closed by a plug, is the cheapest and most cleanly apparatus.

In the construction of the exterior walls of a hospital economy and simplicity would suggest the employment of brick. Whatever style of architecture is adopted, brick can be made to assume all the artistic finish of the most polished stone. But the selection of the material of the exterior wall is entirely a matter of economy and taste. But far different is the question of the character of the internal wall. Here we have to study the effects of hospital miasms upon the materials which surround the sick, and select the substances which enter into the walls, floors, &c., with especial reference to this result.

The great desideratum in this construction of the interior of hospitals is an impermeable material for the walls. The examples are now numerous where hospitals have become uninhabitable owing to the infected condition of the walls. The old English Dreadnought Hospital ship, the walls of which were white-washed wood, had to be abandoned owing to the severe endemics of pyæmia, erysipelas, &c., which prevailed in its wards. On the substitution of a new ship, the *Caledonia*, these affections almost disappeared, but after this latter ship had been in use seven years the same diseases became again prevalent. There can be no doubt, therefore, that the miasma of hospitals will cling to the walls if they are composed of permeable material, and that it is extremely desirable to have them made of some non-absorbent material like glass, and which may be as readily and effectually cleaned. The impropriety of the ordinary plastered wall with hair, is evident. The material now more frequently recommended abroad is Parian cement, which is non-absorbent, and may be thoroughly cleansed, and also glazed tile. Stucco is used in the new Parisian hospitals and gives satisfaction.

It is important, also, that the windows and doors should be as free as possible from absorbent wood-work, and that the wood-work should be reduced to the smallest amount compatible with the proper construction of these passageways. Instead of massive and jutting cornices the wood-work about windows and doors should consist of a mere framework of wood, and that should be so prepared as to be non-absorbent. By waxing and polishing, the wood may be rendered impenetrable.

The floors like the walls should be non-absorbent, and for this purpose waxing and polishing are found to answer the best purpose, the wood being properly chosen. The yellow pine of Florida answers an admirable purpose, as employed in the Pennsylvania Hospital for the Insane. The floor being made of proper material, dry scrubbing should always be practised instead of wet. Vapour in a ward always tends to collect the miasmatic emanations and diffuse them more widely.

Miss Nightingale recommends for the wood-work of wards polished or varnished wainscot oak. "It is the cleanest, most durable, and most satisfactory in use." The reasons of her preference is that oak is more non-absorbent than other wood, but she advises that even this floor should be saturated with beeswax and turpentine. She also states that a hospital floor should be fire-proof by having the joints inlaid with concrete.

In the construction of stairways stone is preferable to iron or wood, the former being readily kept clean, and effectually preventing the noise of those passing over it. This advantage of stone is seen in the Pennsylvania Hospital for the Insane. The stone is of a dark colour—a slate, but very durable—obtained cheaply at Middle Granville, Washington Co., New York. The stairway, as a whole, should also be fire-proof. The same stone could be advantageously used in the halls and corridors both for cleanliness, durability, and to prevent noise.

One of the most difficult questions to determine in hospital construction is, How shall a constant and unfailing supply of unadulterated air be supplied to the sick and still preserve the conditions necessary to personal comfort? Various are the theories that have been suggested by the curious, and ingenious the contrivances to meet this great want. But if we are governed by the opinions of the best authorities, the problem still remains unsolved. No system of artificial ventilation has yet been devised which could meet the conditions above stated. Their almost universal testimony is adverse to all schemes of forced supply of air. "We have no faith," writes an eminent English architect, "as we have often said, in simply scientific ventilation for hospitals. The necessity for artificial ventilation implies, we think, a defect in plan."

Mr. John Robertson, of Manchester, England, says, in his pamphlet on *Improvement of Hospitals*:—

"I repeat what I formerly stated, that so wide is the difference between the wants of a ward filled with the sick and wounded with respect to ventilation, and the wants of every other kind of apartment in which people in health congregate or lodge, that the means which are found sufficient to maintain the purity of the one fail in maintaining the purity of the other."

Equally emphatic is the language of Miss Nightingale in reply to the Barrack Commissioners: "If a hospital must be ventilated artificially, it betrays a defect of original construction which no artificial ventilation can compensate. It is an expensive and inefficient means of doing that which can be done cheaply and efficiently by constructing your building so as to admit the open air around."

The Committee of the English Privy Council appointed to visit for purposes of sanitary inquiry the hospitals of Great Britain report:—

"We have no hesitation whatever in expressing our opinion, founded in all cases on observation and such an examination of recorded facts as we have been able to make, that every pound (and they have unfortunately been many thousands) which has been expended on these costly and elaborate machines (for artificial ventilation), has been wasted. The example of Guy's Hospital is familiar to all medical men in London, and the superiority of the old wards with natural ventilation to the new ones connected with the artificial system, is an admitted fact. * * * These systems (at least those on the principle 'par injection'), do no doubt keep up a constant supply of air to the wards, yet they do not ventilate them."

The Society of Surgery, of Paris, in their recent discussion on Hospital Hygiene, state among their conclusions that artificial ventilation can never supply the conditions of healthiness to a ward.

The Lariboisière Hospital, Paris, is brought forward by the opponents

of artificial ventilation as a melancholy example of the total failure of this system. Constructed according to plans now universally recognized as correct, it has as yet given a higher rate of mortality than the average of the Paris hospitals. And this insalubrity is attributed to the substitution of artificial for natural ventilation. It is stated that the expense of constructing and working this machinery in that hospital amounts to about \$100,000 for construction, and about \$10,000 a year for working, to ventilate a hospital of 600 beds.

Mr. Simon (*op. cit.*), one of the most eminently practical hygeists of the present day, says :—

“Hitherto, I believe without exception, plans of artificial ventilation for wards have been costly and fatal failures. And in the present state of knowledge, the utmost that can be said for them is that some of their appliances (specially those for the withdrawal of used air), may advantageously be used as additions to that more natural ventilation which, at least in this country, has appliances provided for it in the common conditions of decent house construction.”

A late writer thus speaks of the system of artificial ventilation in use at Guy's Hospital, London :—

“At Guy's Hospital may be seen an immense tower, serving as an air shaft for an elaborate system of ventilation, which attracts the admiration of all engineers, and has received medals of honor from exhibition juries, but which makes the wards no healthier, or rather leaves them much inferior in salubrity to the original wards that trust solely to natural ventilation. This system either is, or will be, or at least might as well be entirely disused. We venture to think that if the complete success which has attended the practice of hospitals in which no such machinery is found had been publicly known, this great waste of the hospital resources would not have been incurred.”

Natural ventilation, as distinguished from artificial ventilation, is that which is obtained by means of windows, doors, and open fireplaces. The air instead of being forced through rooms and passages against obstructions, is drawn by those natural agencies, and currents flow continually and with large volume wherever they are required. To accomplish this object the wards should be narrow, the windows large and arranged directly opposite each other, the fireplaces large and well open, etc. The great object is not only to furnish currents of fresh air through the ward, but to flush the floors and ceilings, and to effectually sweep the corners of a stagnant atmosphere. This can only be done thoroughly by windows and doors, and the former must be so arranged as to afford the largest and most direct flow of the external air. The windows should be as numerous as is consistent with the safety of the wall, and extend from the very ceiling to within a few feet of the floor. The fireplaces should be in sufficient numbers to warm the wards effectually, certainly two, and if necessary three, as in the Chorlton Hospital.

In the Stewart Hospital (Richmond, Va.), the fireplaces were four in each ward, arranged in pairs, back to back, in the centre of the ward. These fireplaces were old fashioned, very high, broad, and open. This hospital had been remarkably free from endemic diseases. Miss Nightingale says, “Our grandfathers' lofty fireplaces are the greatest loss in modern house architecture. The little low fireplaces of this date bring the best current of air below the stratum in which we are breathing.”

In regard to the comparative value of natural ventilation, the English Privy Council's Committee report :—

“No amount of cubic feet of space, no plan of building, no artificial system, no combination of all these adjuncts to a good ventilation, has ever been found

to replace open doors, windows, and fireplaces; while provided with the latter, which are the essentials of good ventilation, many old crowded defective hospitals have maintained for a long series of years an amount of success which the most eminent examples of scientific construction have never found practicable. Considering, then, the utter failure of artificial systems and the perfect success of the natural system of ventilation, is it going too far to say that to expend money in the construction and in the maintenance and working of such machinery could, after our present experience, be wantonly to waste and misapply the funds contributed for the benefit of the poor?"

Mr. Simon (*op. cit.*) remarks upon this point:—

"Open windows and (as substitutable for them in certain states of the weather) other direct, but less drastic air-holes through the walls of the ward, are at present the essential *inlets* for fresh air. They also, under many circumstances, are the *outlets* for the used air; but in this function chimneys co-operate with them, acting where fires are alight, very serviceably as outlets; and it never can be otherwise than advantageous to the ventilation of a ward that subsiding shafts should give a greatly increased development of that ordinary chimney-action. For in ventilation, then, our reliance must be upon direct air-holes—of which open windows are the chief; on these same means we must also, under ordinary circumstances of construction, rely for a large share of out-ventilation; and thus, whatever other appliances exist, a ward must be perfectly ventilable by its windows."

While strongly advocating the introduction of natural methods of ventilating to every portion of the hospital, and of heating wards by means of fireplaces, it is not to be understood that artificial methods of heating are altogether discarded. What authorities insist upon is, that all artificial methods of heating shall be subordinate to the grand idea of ventilation by natural means, viz: fireplaces in use, windows, doors. And the same remark applies to the employment of additional means of ventilation. Whatever they may be, they should be but accessories, never principles in ventilation. This opinion is forcibly pressed by the Committee of the Privy Council (*op. cit.*):—

"We do not intend to assert that artificial ventilation or artificial heating do any harm if applied to wards which are kept healthy by the use of the natural means of ventilation. * * * We have a strong conviction that where such machinery is used as a substitute for natural ventilation and open fireplaces, it will produce the most deadly results, and this conviction is founded on what we have learnt both at the Parisian hospitals, where such systems are still in use, and at the British hospitals, where (when used as they are in Paris) they have all failed to stand the test of practice, and have been given up."

It must be remembered that the above opinions are given by foreign authors, and that the method of ventilation so strongly urged, is adapted to a mild climate. It is very questionable whether, under any circumstances, natural ventilation can be entirely relied upon in more rigorous northern winters. Indeed, from our own personal examination of different methods of securing natural and artificial ventilation in the hospitals of this country, we are convinced that the two must be combined, the former being resorted to in the summer and the latter in the winter. The fan is, perhaps, more generally employed than any other apparatus, and when due regard is had to the heating of the air, and the inlets and outlets in the ward, it serves an admirable purpose. In the State Insane Asylum, at Utica, New York, Dr. Gray has introduced the fan, and so graduated the volume of in-coming and out-going air of the ward that a decided pressure is constantly exercised upon the contained air of the ward. This pressure is such as to move the air in endless currents, and renew the entire volume with remarkable frequency.

The central administrative building should stand so related to the pavilions as to preserve complete isolation, and yet economize distance. One of the principal objections alleged against the pavilion plan is the wide separation inevitable between the administration and the wards. This, however, is not absolutely necessary, as may be seen in the Rhode Island, the Emigrant, City (Boston) Hospitals, &c. &c. The administrative building should have a central position, and be so related to the corridors as to afford easy access to all the wards. It should be exclusively devoted to administration, and should contain only the officers' apartments, the offices, the governors' rooms, &c.

The kitchen is frequently located in the basement of the central building, but it is better to give it a separate position. It should be light, well-ventilated, and its walls should be constructed of materials which will not be affected by steam and which are non-absorbent. The floor should be of stone—slate of very large size.

The wash-house should be separated from all the other buildings, when practicable, as it is the receptacle of the foul linen and infected clothing. It should have perfect through-and-through ventilation, and the walls and floors, like the kitchen, should be of non-absorbent material.

The operating room is too often located in the upper story of the hospital. It should be most accessible from all the surgical wards. For this purpose it should be near the centre, and on that floor nearest the surgical wards. It should be well aired, well warmed, and have the light directed upon the table from above as well as from the sides. It is well to have a large bathing tub at hand, or in an immediately adjoining room, which can at a moment be supplied with hot water, as in the Boston Hospital, for accident cases in collapse. It is well, also, to have small wards adjoining the operating room into which severe cases can be temporarily placed before or after an operation.

The application of the foregoing principles to hospital construction are evident. The striking defects in the arrangement of the older hospitals were that the wards ventilated into each other; corridors and stairways were ventilating shafts to wards; water-closets, sculleries, and other accessory rooms were indifferently ventilated into wards or into each other. It is now apparent that the utmost hospital unhealthiness was created by this method of construction. The remedy for this defect consists in a separate and independent ventilation for each department, that is, each has its inlet and outlet of air without connection with others. In the first place, there should be a free circulation of air completely around the building. No building, or trees, or other obstructions should be allowed to intercept the currents of air. All adjacent buildings, as pavilions, should be so separated that they cannot obstruct the winds. The ward should run north and south, or nearly so, in order to have an east and west exposure.

These principles are inculcated by the highest authorities. Says an eminent English writer :—

“There must be no stagnation. A court, with high walls around it, does one thing with certainty—it stagnates the air and renders it unfit for respiration. All closed courts, narrow culs-de-sac, high adjacent walls, closed angles, overshadowing trees, and other obstructions to outer ventilation should be sedulously avoided at whatever cost. * * * The most simple form of structure for insuring ventilation and light is to build hospital wards in a straight line, with windows on both sides.”

The ward should be as narrow as can be compatible with its special arrangements for the purposes of bringing its opposed windows near together.

The windows should open directly into the free air; they should be arranged directly opposite to each other; they should be as numerous and as large as the wall will admit and as convenience will require; they should reach from the ceiling to within a few feet of the floor; they should be square at the top. Double sashes may be provided to prevent too free ingress of air, or an extreme upper portion of the window may be made to open separately. Open fireplaces should be constructed at proper points of the ward for the purpose of both heating and ventilation.

Mr. Simon (*op. cit.*) remarks :—

“Hospital construction has *pro tanto* failed in its first obligation if the form and arrangement of wards, and the distribution and planning of windows be not such that each separate ward (independently of all other wards, and of all staircases, passages, corridors, and offices) shall admit of that kind of ventilation in its completest possible form. An oblong ward from 25 to 30 feet wide, windowed correspondingly on its two long sides with sash windows reaching to the top, and windowed in such proportion to wall that between each two windows there shall be the required space for one bed-head, and having its communications and separately ventilated offices at its two ends; this, by common consent, is the form of ward which best of all answers the proposed purpose. And in proportion as this form is departed from, in such proportion, sooner and sooner, will the limit of the ward’s usefulness be reached—the point, namely, at which ventilation will prove insufficient—the point at which typhus will spread from bed to bed, and at which traumatic infections will arise among surgical cases.”

In the second place, the water-closets, bath-rooms, sculleries, &c., should not only be separated from the ward, but they should have a separate ventilation so perfect that their emanations can under no circumstances penetrate the ward. This can be effectually accomplished in the pavilion, and still have each room or apartment entirely serviceable to the patients. The proper method of isolation requires that these accessory rooms should never communicate directly with the ward, but by passages which are ventilated by opposing windows. Each apartment should have, in addition, its own inlets of fresh air and outlets of foul air.

The corridor and stairways should also be independent of the ward and of each other. The corridor should be so open that it can never be the receptacle of foul air, and can never obstruct the circulation of the grounds. This may be effected by arcades. The stairways should equally have their opposing windows, with a through ventilation, so thorough and constant that no stratum of air can stagnate.

In conclusion we would enforce the maxim of the British Barracks and Hospital Commission, viz., the objects “sought in the construction of a hospital is the recovery of the largest number of sick to health in the shortest possible time, and to this end everything is only subsidiary.” In this proposition we have the groundwork of substantial reform, and until it becomes the ruling principle with architects and all interested in these institutions, hospitals will not fulfil their true mission. Hitherto we have studied too exclusively architectural effect, and in our zeal to vie with other public buildings, have lost sight of the humble and sacred purpose to which a hospital is dedicated. If richly carved work, fanciful windows, imposing towers, etc., were essential elements in the successful treatment of the sick, the former style of hospital architecture would admirably serve the purpose of life-saving. But when we recall the fact that the largest success in the treatment of the most dangerous and fatal forms of disease is in the simple tent on the open field, we fully realize how vain, indeed, how criminal, is the expenditure of money in merely architectural extravagance.

S. S.

ANALYTICAL AND BIBLIOGRAPHICAL NOTICES.

ART. XX.—*Transactions of American State Medical Societies:—*

1. *Seventeenth Anniversary Meeting of the Illinois State Medical Society, held at Springfield, June 4th and 5th, 1867.* 8vo. pp. 212. Chicago, Illinois, 1867.
2. *Transactions of the Medical Society of West Virginia, including Proceedings of the Medical Convention, held at Fairmount, April 10th, 1867.* 8vo. pp. 58. Wheeling, Va., 1868.

1. THE *Transactions of the State Medical Society of Illinois* for 1867 commences with a Report on Cholera as it appeared in Chicago in 1866, by Dr. W. B. MARSH, which, as it presents nothing new, we need not stop to analyze.

The report next in order is a "Supplemental Report" to that from the Committee on Practical Medicine, by S. T. HEWINS; giving an account of the diseases more especially of the eastern and southern portions of the State.

The face of the country of that portion of the State of Illinois treated of in this report, we are told, somewhat resembles in shape an irregular triangle, the apex of which rests at the junction of the Ohio and Mississippi rivers, in latitude 37° north, and at an altitude of only about 300 feet above the Gulf of Mexico. Extending north, towards the base of the triangle, the face of the country is generally undulating, and as it stretches out between its eastern and western boundaries it becomes a vast prairie of table lands, reaching an altitude of more than 500 feet above the confluence of the Ohio and Mississippi rivers, beautifully interspersed with groves and belts of timber, especially along the streams. The general inclination of this vast plane is from north to south. These table lands form, as it were, a dividing ridge through the middle and southern portions of the State, so that the water sheds off towards the east and southwest. The upper waters of most of the tributary streams from the north and west of the Ohio and Wabash, have their source in ponds or small lakes, and extensive marsh lands—not unfrequently, extensive marshes are developed in the bottoms along the course of the streams, which, in many places, are subject to inundations in the spring and summer, forming them into bayous or ponds, abounding in drift and other deposits from the luxuriant vegetable growth in their vicinity. The water from these extended ponds is dried up during the hot season, allowing the vegetable matters thus left bare to decay, and the rich summer harvests of the State are thus succeeded by autumnal fevers (chiefly bilious, intermittents, and remittents), both of a mild and malignant character. A curious fact is mentioned in reference to the colliers; namely, that although full twelve hours out of the twenty-four above ground, and that also during the night time, they are almost entirely exempt from the above fevers.

A form of fever is noticed as prevailing in some parts of the district somewhat resembling typhoid, but wanting many of the characteristics of that disease, as it presents itself in hilly, elevated localities with a crowded population. It has received from the physicians of the army the name of typho-malarial fever. The disease, which is well known to the physicians of the western portions of Pennsylvania, presents a kind of combination of the symptoms of bilious remittent and those of enteric fever.

Cerebro-spinal meningitis has prevailed in different parts of Illinois with frightful mortality. Cholera has prevailed to a more or less extent throughout many portions of the State. Variola has been much less prevalent during the past than during some years preceding. The more fruitful sources of its spread have been diminished since the close of the war, while greater vigilance has been exercised to control it by efficient vaccination, and the repetition of the operation

whenever there is danger of an outbreak of the disease. Diphtheria has been met with, chiefly in the middle portion of the State. Though of a troublesome form, it by no means constituted a serious epidemic.

Rubeola occurred as an epidemic in only one locality, Champaign County; where during the three winter months it was characterized by great severity. About one thousand persons fell victims to the disease, of which about one-twentieth were adults.

Dr. George T. Allen, of Springfield, describes a plan of treatment for the radical cure of inguinal hernia. Further experience is necessary to test its efficiency.

The next communication is a Series of Experimental Inquiries concerning the Physiological Effects of Alcoholic Drinks on Man, by Professor N. S. DAVIS, M. D., of Chicago. The following are the conclusions to which the Professor has been led: 1st. The presence of alcohol in the blood directly interferes with the normal play of vital affinities and of cell action, in such a manner as to diminish the rapidity of nutrition and disintegration, and, consequently, to diminish the dependent functions of elimination, calorification, and innervation; thereby making alcohol a positive organic sedative, instead of a diffusible stimulant, as it is popularly supposed to be both in and out of the profession. 2d. That alcohol acts in the system exclusively as a foreign substance incapable of assimilation or decomposition by the vital functions, and is ultimately excreted or eliminated without chemical change.

The Report on Obstetrics, by Dr. D. L. MILLER, of Chicago, consists of some very interesting observations, comprising a case of arm presentation with impaction of the fœtus, and an account of the proceedings adopted to procure the delivery of the child, so as to secure the life of the mother; a case of rupture of the uterus, in which death took place immediately after the expulsion of the fœtus by the natural efforts; a case in which there was an unequal development of twins. In this case, after the birth, at the proper period, of a full-grown living child, there was delivered a fœtus of six months, having no placenta or umbilical cord. The histories are given of three cases of ovarian tumour with recovery without an operation. The *first* occurred under the care of Dr. Dodge, in a female, aged 32 years, twelve years married—mother of two children, youngest four years old—miscarried once between the two births. Menstruation regular in time, but profuse. On examination a tumour rising above the pelvis to the right of median line was detected. In consultation a considerable enlargement of right ovary diagnosed. Under a treatment consisting in the administration of laxatives and tonics, with, alternately, the iodide and bromide of potassium, the chlorate of potassa, bitter tinctures, nutritious diet, and counter-irritants over seat of tumour. The tumour continued to increase four months, remained stationary for two, when it began to lessen in size, and at the end of about ten months entirely disappeared. The *second* occurred under the care of Prof. Rea. The treatment consisted in counter-irritation over seat of tumour, purgatives, tonics, iodide and bromide of potassium. After the lapse of several months the tumour began to diminish in size, and finally disappeared, leaving the patient perfectly well. The *third* case occurred under the care of Prof. Miller, in a female 36 years old, the mother of two children; had one miscarriage. Tumour first detected after an attack of peritonitis; it continued to enlarge, and at the end of three years and four months had reached the size of a foetal head. The patient was treated by laxatives, tonics, and nutritious diet, with counter-irritation over tumour, and as alteratives, iodide and bromide of potassium. General health of patient improved, growth of tumour ceased. In August, 1866, the patient became pregnant. During gestation some degree of pain was felt at the seat of enlargement. The ordinary means were resorted to to prevent inflammation occurring in the enlarged ovary. May 7th, 1867, the patient was delivered of twins; one of them was very feeble and only survived about twelve hours. The other is living and healthy. June 2d, 1867, a careful examination failed to detect any appreciable enlargement of either ovary. The patient recovered as well as usual from her confinement. Prof. M. queries whether the diminution in the size of the tumour was due to the continuous pressure exercised for so many months by the enlarging uterus. A summary is given of the general facts observed in eight cases of

pelvic cellulitis occurring in the practice of Prof. Rea, of Chicago. Five of the patients were married, two widows, and one was single. In two cases, suppuration occurred with discharge of pus. One had a renewal of the inflammation about two months after recovery from first attack, which was, however, subdued by appropriate treatment. In three instances, the disease followed the replacement of retroverted uterus by the uterine sound. In the case of the unmarried patient there was general peritonitis. In five of the cases suppuration was certainly prevented by early and judicious treatment, while the histories of at least two other cases leaves no room to doubt that a like favourable result would have been attained had a proper treatment been opportunely applied.

The report closes with some very sensible remarks on the use and abuse of the speculum in the investigation of the diseases of women.

The report is followed by an Essay on Drugs and Medicines, by Dr. BAILHACHE, of Springfield. There having been few new medicines introduced during the past year, Dr. B. confines his remarks to such as have claimed the attention of the profession for a longer period, but the usefulness of which, it seems to him, has not as yet been fully developed.

The next paper is by Dr. J. S. HILDRETH, of Chicago, on the Cause and Treatment of Panniform Cornea, occurring with Granular Ophthalmia. This is succeeded by the Report of the Committee on Surgery, by Dr. H. W. DAVIS, of Paris, Illinois, and is devoted to the subject of the resection of injured and diseased portions of the long bones and the formation of new bone, so that the limb shall be restored to its proper length and strength to enable it to subserve the wants of the patient, and is of considerable interest.

The next Report is on Medical Specialties and Advertising. It is signed by two of the Committee, Drs. T. D. Fitch and N. S. Davis, and though cautiously worded seems to us not to take that high stand which we conceive to be demanded by the profession. The remaining member of the Committee, Dr. D. Prince, presents a separate report, of a radical character, from the ethical doctrines and conclusions of which we must express our pointed dissent.

A description is given, by Dr. A. Niles, of Quincy, Illinois, of a Pocket Obstetric Forceps. To understand the form and construction of these forceps the paper by Dr. N., with its accompanying drawings, must be referred to.

Tracings of the Pulse with Marey's Sphygmograph are described by Prof. H. A. Johnson, of Chicago. To understand the subject the thirteen diagrams with which the paper is illustrated must be consulted.

The concluding paper, a Report on Plastic Surgery, by Dr. DAVID PRINCE, of Jacksonville, Illinois, is a very long one, occupying ninety-six pages, and is illustrated by a large number of wood-cuts. Some parts of it have already appeared in medical journals and other professional works. We regret that it will not admit of any instructive analysis, while space could not be allowed us even if we felt prepared to enter into a critique of the author's teachings.

2. The *Transactions of the West Virginia Medical Society*, at its first session, are those of a new State Medical Society, organized on the 10th day of April, 1867, in a State not yet five years old. The volume before us is mainly occupied with the proceedings connected with the organization; these exhibit a proper spirit and a correct appreciation of the field of usefulness which these societies, when properly conducted, must necessarily occupy, whether in reference to the individual members of which they are composed or to the members of the committees in which they are respectively located.

But few matters of a purely scientific character have found a record in the *Transactions* before us; we nevertheless anticipate, provided the physicians of West Virginia exhibit the same zeal as those have displayed to whom the organization of the State Medical Society is due, a volume of Transactions every year, the contents of which will be received by the profession here and abroad as an acceptable and valuable contribution to the general fund of knowledge in the several departments of medicine.

If the medical men of the young State carry on well and in concert the work they have so well begun, they cannot fail to become, speedily, the means of advancing largely our noble science, of greatly ameliorating the sufferings of

those who may be the subjects of disease or accident, and in establishing in its midst a body of learned and skilful physicians, that shall elevate the State to a level with her older and more favoured sisters.

D. F. C.

ART. XXI. *Reports of American Hospitals for the Insane.*

1. *Of the Taunton Hospital, for the fiscal year 1866-67.*
2. *Of the Butler Hospital, for the year 1867.*
3. *Of the King's County (N. Y.) Asylum, for the fiscal year 1866-67.*
4. *Of the State Hospital, Pennsylvania, for the year 1867.*
5. *Of the Maryland Hospital, for the year 1867.*
6. *Of the U. S. Government Hospital, for the fiscal year 1865-66.*
7. *Of the Tennessee Hospital, for the fiscal year 1866-67.*
8. *Of the Central Ohio Asylum, for the year 1867.*
9. *Of the Southern Ohio Asylum, for the year 1867.*
10. *Of the State Hospital, Wisconsin, for the fiscal year 1866-67.*

1. THE twelfth annual report of the *Taunton Lunatic Hospital* contains the following medical statistics of the official year ending September 30, 1867:—

	Men.	Women.	Total.
In hospital at beginning of year . . .	163	178	341
Admitted in course of the year . . .	129	136	265
Whole number . . .	292	314	606
Discharged, including deaths . . .	113	117	230
Remaining at the end of the year . . .	179	197	376
Of those discharged, there were cured . . .	45	45	90
Died . . .	21	18	39

Died of paralysis, 5; maniacal exhaustion, 5; general paralysis, 4; marasmus, 4; diarrhoea, 3; apoplexy, 3; phthisis, 2; inanition, 2; old age, 2; suicide, 2; dysentery, epilepsy, disease of heart, carbuncle, chorea, pneumonia, and variola, 1 each.

"The proportion of recoveries is somewhat larger among males than among females, the former exceeding the latter about seven per cent. This has been erroneously attributed to want of a proper knowledge on the part of the medical officers of asylums of the nature and treatment of the diseases peculiar to the female sex. The true cause of the difference, however, which is not very marked, is to be found in the different proportion of the mental and physical causes of the disease in the two sexes. In the males, the physical causes—intemperance, excess, accidents and exposures—predominate. These are most amenable to treatment, and offer the most promising prospects of removal and cure. In females, the mental causes—disappointments, religious excitements, losses of friends, and wounds of the affections and sensibilities—are in excess; and these are too often beyond the reach of medical skill. They are deeper and more obscure, less easily discovered and understood, and, when found, are situated where the remedy, if known, is less easy of application."

Dr. CHOATE expresses the following opinion on a subject which has awakened much discussion within the last few years:—

"The contest between the two systems of aggregation and of separation of the insane, each of which has had its zealous advocates, would seem now, by the general consent and almost unanimous practice of the civilized world, to have been settled in favour of the former, under which safety, economy, and general welfare appear to be most effectually secured. It has been proved beyond a question, that when the restraints belonging to a compact central institution, built and organized for the purpose, are removed, much more severe means of discipline must necessarily be used to insure safety from accident and disorder. In the view of economy, too, the well-known fact cannot be lost sight of, that increase of numbers, under the same roof, does not of necessity carry with it

increase of all expenditures—or, at any rate, not an increase proportionate to the numerical addition, the necessary expenses in some directions being nearly the same for one thousand as for five hundred.”

2. The first annual report by Dr. JOHN W. SAWYER, the successor of Dr. Ray, at the *Butler Hospital for the Insane*, furnishes the following facts from the medical history of the year 1867:—

	Men.	Women.	Total.
In hospital at the beginning of the year	59	60	119
Admitted in course of the year	41	36	77
Whole number	100	96	196
Discharged	33	32	65
Remaining at the end of the year	67	64	131
Of those discharged, there were cured	—	—	29
Died	—	—	14

Died with chronic mania, 7; acute mania, 2; organic disease of brain, 3; apoplexy, 1; general paralysis, 1.

Both the fatal cases of acute mania were brought to the hospital in a state of extreme exhaustion, and beyond reasonable hope of cure. In regard to treatment, Dr. Sawyer says: “Little change has been made in the general management of the Institution. Kindness and forbearance have invariably been the guiding principles of treatment. While we have not hesitated to use drugs whenever indicated for the removal of constitutional disturbance, we have relied much on moral treatment. No pains have been spared to cause the patients to forget their delusions, and engage in the various kinds of amusement and occupation provided for them. The bowling and billiard-rooms have been daily filled with an eager company of players. The museum and reading-room, largely supplied with pictorial papers and books, has been a favourite place of resort, and has lightened the burden of suffering to many. The library continues to be largely patronized, eighty volumes being usually in circulation at the same time. Our frequent evening entertainments are witnessed by a goodly company, and the eagerness of all for rides and walks attests the attractiveness of our grounds.”

“During the winter evenings we have had frequent exhibitions of the magic lantern, with familiar explanations of the pictures shown. Small social parties have frequently been held in the various galleries, for patients of either sex, with games, music, and light refreshments.”

3. The *King's County Asylum (N. Y.)*, already, according to the report before us, having more than five hundred patients, is soon to be enlarged.

General results of the fiscal year 1866-67:—

	Men.	Women.	Total.
Patients at the beginning of the year	197	273	470
Admitted in course of the year	115	116	231
Whole number	312	389	701
Discharged, including deaths	101	84	185
Remaining July 31, 1867	211	305	516
Of those discharged, there were cured	37	47	84
Died	33	19	52

Deaths from phthisis, 8; epilepsy, 8; general paralysis, 6; exhaustion, 5; diarrhoea, 5; paralysis, 3; convulsions, 3; meningitis, 3; pneumonia, 2; purpura, abscess, congestion of brain, softening of brain, gangrene, syphilis, empyema, ossification of arteries, and mania-a-potu, 1 each.

“With cholera on every side last summer, it is wonderful that the inmates of this Institution should have been allowed to enjoy an entire immunity.”

“The increasing prevalence of mental and nervous disorders,” remarks Dr. Chapin, “may be attributed, in a great measure, to the fact that the young of the present day manage to elude the watchful care of their guardians at an earlier age than in former times, and mingle with the world before their minds are matured in anything. Beyond the pale of parental control, they become a

law unto themselves; and without experience in the ways of the world, they are ever liable to fall an easy prey to the wiles of the crafty and designing, under whose guidance they become adepts in every kind of vice, and, in their turn, tend to demoralize all with whom they come in contact; and demoralization, though entirely distinct, is a condition extremely favourable to the access of both moral and intellectual derangement."

4. In the course of the year 1867, the *State Lunatic Hospital of Pennsylvania* was improved by additions which supply infirmaries to ten wards, five for either sex.

	Men.	Women.	Total.
Patients in hospital Jan. 1st	181	146	327
Admitted in course of the year	99	71	170
Whole number	280	217	497
Discharged, including deaths	95	62	157
Remaining December 31st	185	155	340
Of the discharged, there were cured	35	16	51
Died	14	20	34

Causes of death.—Exhaustion of acute mania, 4; exhaustion of chronic mania, 19; injuries from another patient, 1; injuries from railroad train, 1; disease of brain, 5; disease of lungs, 4.

"The entertainments on each evening of the week for the amusement, recreation, and instruction of the inmates, have been regularly continued during six or seven months of the year. These entertainments are designed to be as varied in their character as possible, and consist of readings in prose and poetry from the best authors, selections in history, biography, travels, and natural history; explanations of various phenomena in natural philosophy and chemistry, which are constantly met with in ordinary life; illustrations in physical geography, the exhibition of views of historical scenes and buildings by the magic lantern—and, in fact, whatever may be found most fully to answer the object of enabling all to find some new source to which their thoughts may be directed. The attendance varies from one-third to one-half the inmates, and no more orderly and attentive audience ever favoured a lecturer with their presence."

Dr. CURWEN discusses the question of the increase of insanity, and apparently arrives at the conclusion that there is no such increase beyond the relative augmentation of the population. "The greater the population," says he, "of course, the greater the number of the insane; and in this fact—the constant regular increase of the population—will be found the true solution of the larger number of insane than in previous years; though the better knowledge of the treatment in hospitals, and the greater confidence in the management of these institutions, undoubtedly has an effect in bringing out many cases which were carefully concealed from the knowledge of the public generally."

5. The report for 1867 of the *Maryland Hospital* is mainly devoted to the material interests of the institution.

	Men.	Women.	Total.
Patients Jan. 1st (2 of mania-à-potu) . . .	61	40	101
Admissions (48 " " " ")	87	28	115
Whole number (50 " " " ")	148	68	216
Discharged, including deaths	84	19	103
Remaining, Dec. 31	64	49	113
Discharged as recovered (45 of mania-à-potu) .	53	7	60
Died (including 5 of mania-à-potu)	13	3	16

"In recording certain cases *as recovered*," says Dr. FONERDEN, "it is intended to express a meaning different from that of confidently asserting, without qualification, that such cases are fully recovered. The expression '*as recovered*' means, in this report, *seeming to be recovered*. It was a favourite expression, and I think a proper one, used with nice discrimination by the late Dr. Bell, of the McLean Asylum. The decision respecting the recovery of an insane mind

implies two preliminaries: the character of the judgment of the expert deciding; and the general ideal in his mind, by which he judges of the actual mental condition of a particular case. Experts, like men in general, differ in their judgments and also in their ideals. Cases regarded as examples of recovery by one, would not be so regarded by another, after a critical examination of them; and a strict critic will affirm that insanity is never an entity that can be taken away from the mind without leaving a vestige."

6. The war of the rebellion being ended, and the number of soldiers and seamen greatly reduced, it must necessarily follow that the scale of operations at the United States *Government Hospital for the Insane* would become more limited. The number of admissions in the official year 1865-66 was but little more than forty-three per cent. of the admissions in the preceding year.

	Men.	Women.	Total.
Patients in hospital June 30, 1865 . . .	168	93	261
Admitted in course of the year . . .	194	28	222
Whole number	362	121	483
Discharged, including deaths	177	25	202
Remaining June 30, 1866	185	96	281
Of those discharged, there were cured .	106	6	112
Died	42	12	54

"Died with chronic, organic, and functional degeneration of the brain, without complicative or supervenient disease before death, 16; chronic, organic, and functional degeneration of the brain, with epilepsy, 3;" apoplexy, 3; serous apoplexy, 1; typhoid fever, 3; diarrhœa, 1; phthisis, 3; dysentery, 1; chronic hepatitis, 1; tubercular peritonitis, 1; perforating ulcer of ilium, 1; tumour of the brain, 1; sunstroke, 1; erysipelas, 1; maniacal exhaustion, 4; inanition, 2; typhoid fever, 1; epilepsy, 2; typhoid pneumonia, 1; exhaustion of acute melancholia, 1; diarrhœa, 1; phthisis, 1; marasmus, 1; softening of the brain, 2; drowning, 1.

"In the first years of the history of the institution, three-fourths of its inmates were from civil life. During the war the ratio of the civil to the military cases was reversed, and now they have become nearly equal."

A large part of Dr. NICHOLS's report is occupied by an argument to show the importance of hospital treatment, and the duty of the friends of a patient "of according a cordial and steady support to the medical officers in charge of him, in carrying forward the measures instituted for his comfort and restoration—not for a month or a quarter, but for years, if he be not sooner restored, or his disorder assume some phase that precludes all reasonable expectation of recovery."

In the course of this argument he says that he has "found most practical men to express themselves to the effect that high-paying patients give twice the trouble and anxiety that yeomen do, and are not half as likely to recover;" and that he "fully believes that a hundred or two of insane persons in the United States, possessing every advantage of birth, education, and fortune, and every opportunity for usefulness, could they be restored to health and reason, are annually doomed to chronic insanity—that living death of moral beings—by delay of friends in placing them under proper treatment, by various interferences with treatment while it is continued, and by intermitting or altogether interrupting it before a probable recovery."

7. The report under notice, from the *Tennessee Hospital for the Insane*, embraces a period of eighteen months, from April 1, 1865, to September 30, 1867, both inclusive.

	Men.	Women.	Total.
Patients in hospital April 1, 1865 . . .	94	76	170
Admitted in eighteen months	163	100	263
Whole number	257	176	433
Discharged, including deaths	124	62	186
Remaining Sept. 30, 1867	133	114	247
Of those discharged, there were cured .	53	39	92
Died	24	12	36

Died of marasmus, 7; phthisis, 4; tabes mesenterica, 4; paralysis, 3; maniacal exhaustion, 3; variola, 3; apoplexy, 2; epilepsy, 2; typhoid fever, 2; cataleptic mania, anasarca, encephaloid tumour, pneumonia, hæmoptysis, and suicide, 1 each.

In addition to the foregoing, the report says: "Of the African race we have received and treated twenty-nine—thirteen men and sixteen women—and have discharged two men and one woman *restored*. Two men have died of inflammation of the brain. Leaving in our care, 1st of October, 1867, twenty-four coloured.

"The aggregate number of white and coloured insane now in the two buildings, and subject to treatment, is two hundred and seventy-one."

"Our register," says Dr. JONES, "shows insanity to be alarmingly on the increase, and that whiskey is one of its most fruitful causes. It thus appears that intemperance has caused but a little less than ten per cent. of insanity developed in the State in the last two and a half years."

During the period covered by the report, the number of patients resident has largely increased, and many improvements have been made in the material of the institution.

Dr. Jones advises the commencement of two more hospitals for the insane, in different sections of the State.

8. In his report for the official year 1866-67, Dr. PECK, of the *Central Ohio Lunatic Asylum*, says:—

"This asylum is now full to its utmost capacity. All that can be expected of us will be to admit all *recent* cases that occur in our district, and retain as many chronic patients as will be necessary to keep the asylum full."

	Men.	Women.	Total.
Patients in hospital Nov. 1, 1866 . . .	137	163	300
Admitted in course of the year . . .	92	109	201
Whole number . . .	229	272	501
Discharged, including deaths . . .	79	92	171
Remaining Nov. 1, 1867 . . .	150	180	330
Of those discharged, there were cured . .	60	65	125
Died . . .	7	8	15

Deaths from consumption, 4; acute maniacal exhaustion, 4; organic lesions of the brain, 2; dysentery, gangrene, exhaustion and general decay, disease of heart, and general paralysis, 1 each.

"Although many patients recover without medicine," says the report, "yet the physician to the insane will find it necessary to draw largely upon the *materia medica* for aid. One cannot exercise too careful a discrimination in the selection and application of remedies. Inasmuch as we have no specifics for the cure of insanity, we must necessarily be guided in our treatment by the general principles of medicine, together with the experience gained by our special knowledge of mental disorders."

"We have added to our list of in-door amusements light gymnastics. Our class numbers about forty of both sexes, and I am happy to say that this amusement is a decided success." * * The buildings have been greatly improved in the course of the year, and "the cottage hospital is now ready for use."

9. At the date of the report now before us, the roofing of the new wings of the *Southern Ohio Lunatic Asylum* had been begun, and it is expected that the structures will be finished in the summer of 1868.

	Men.	Women.	Total.
Patients in hospital Nov. 1, 1866 . . .	81	96	177
Admitted in course of the year . . .	56	49	105
Whole number . . .	137	145	282
Discharged, including deaths . . .	54	50	104
Remaining Nov. 1, 1867 . . .	83	95	178
Of those discharged, there were cured . .	31	35	66
Died . . .	8	3	11

Causes of death.—Mania, 3; consumption, 3; suicide, 2; paralysis, apoplexy, and disease of heart, 1 each.

We make an extract from Dr. GUNDRY's remarks upon the policy pursued in Ohio in regard to the treatment of the insane:—

"The spirit of the laws of Ohio happily accords with the results of numerical investigation. As these establish a great probability of recovery in favour of those whose disease has continued less than twelve months, and a less probability after that period; so the law, recognizing the former as *recent* cases, gives them the preference over all others. To this policy we may attribute the fact that the increase of the insane population in our State has been kept at a minimum. Thus it happens, that the operations of this Institution have, in a great measure, been limited to the reception and treatment of recent cases. The want of room hitherto (not the law, as many suppose) has excluded, as a class, the chronic insane, though from time to time many have been admitted." * * * "It has been our good fortune not to be compelled to reject any recent case for whom application has been made. As soon, therefore, as our new wings shall be completed, the additional number to be accommodated will necessarily be drawn from the chronic insane, who will be sent from the county infirmaries and jails to the comfortable home now in preparation for them.

"The same result will occur wherever additional accommodation shall be made in our State for the insane; the chronic insane will be chiefly benefited, though recent cases will receive an incidental advantage from the increased means of classification afforded by the new arrangements. This policy is at once the noblest and wisest course towards the afflicted. May the time never come when the pressure of circumstances will compel the adoption of the opposite policy—the division of the insane into two classes, the one to be cared for properly, the other to be lodged apart, allowed the barest subsistence, and awarded the most meagre accommodations; for who can doubt that such would be the natural consequence of branding them as incurable in a house specially built for their retention, from which no improvement is ever expected to ensue."

"The recent and chronic insane will, I trust, ever mingle together upon the same terms, in capacious and well-regulated institutions, and no receptacle ever be built, in Ohio, into which to thrust those arbitrarily designated as incurable, where the friendless would inevitably drift."

10. Each of the two wings of the *Wisconsin State Hospital for the Insane* is in process of enlargement by the addition of two sections. This will double the capacity for patients of the hospital, enabling it to accommodate 350.

	Men.	Women.	Total.
Patients in hospital Oct. 1, 1866	96	84	180
Admitted in course of the year	55	59	114
Whole number	151	143	294
Discharged, including deaths	61	53	114
Remaining Sept. 30, 1867	90	90	180
Of those discharged, there were cured	—	—	40
Died	—	—	10

Died of exhaustion from chronic mania, 4; phthisis, 2; cerebro-spinal meningitis, 1; gastro-enteric fever, 1; organic disease of brain, 1; "general paresis," 1.

"Very few patients," says Dr. VAN NORSTRAND, "seek an entrance here whose physical systems are in good condition; some one or all the great organs of the body are not performing their normal functions. * * * I find much more use for certain classes of medicines than when in private practice. Stimulants, tonics, sedatives, deobstruents, anaphrodisiacs, emmenagogues, and anti-periodics, are in daily use here; thereby shortening the period of excitement and recovery,—and if recovery is not effected, improving the bodily health and diminishing the per cent. of mortality."

In regard to that part of the "moral treatment" which consists in labour, the Doctor says: "An average of fifty per cent. of our male patients have been

daily employed in assisting in various labours about the farm, garden, kitchen, engine-house, cattle yards, grading and filling, improving about the new wings, etc. * * * I begin to feel that we are a step in advance of most other American institutions in furnishing desirable employment and diversions for our male patients. But we are seeking earnestly some out-of-door employment for our females, where they can have the benefit of air and sunlight."

The average of male patients employed is large.

The account which the Doctor gives of the conduct of visitors in the wards of this hospital, furnishes the writer of these notices the opportunity to express his conviction that the indiscriminate admission to the apartments of patients, in our institutions for the insane, of persons not connected with those institutions, is a practice utterly unbecoming to a people claiming to possess the common feelings of humanity.

P. E.

ART. XXII.—*Therapeutics and Materia Medica; a Systematic Treatise on the Action and Uses of Medicinal Agents, including their Description and History.* By ALFRED STILLÉ, M. D., Professor of the Theory and Practice of Medicine and of Clinical Medicine in the University of Pennsylvania, &c. &c. Third edition, revised and enlarged. In 2 vols. 8vo. pp. 824 and 864. Philadelphia: Henry C. Lea, 1868.

THE third edition of Professor Stillé's work on *Therapeutics and Materia Medica* lies before us fresh from the press of Mr. Henry C. Lea, of Philadelphia. The first edition appeared in 1860, the second in 1864, and the present one bears on its title-page the date of 1868. In the short period of eight years no less than three editions of this elaborate, not inexpensive, and scientific work have been called for. Like its predecessors, it is in two volumes, which contain somewhat more than eight hundred pages each. The fact of a demand for three editions of such a work in so short a time is sufficient testimony to its value. But more than this, we regard the demand for it as not less honourable to the medical profession of the country than gratifying to its author. To seek for and appreciate a work like this implies, to say the least, a creditable amount of culture on the part of the physicians of our country. We may be hopeful of their future when such books are in demand.

We expressed our estimate of the value and character of Dr. Stillé's treatise when the first edition of it appeared. A longer and closer acquaintance with it has not changed the favourable opinion we then formed, unless, perhaps, to make us value it more now than we did then. It is, therefore, sufficient for us to chronicle the appearance of the present edition, and to congratulate the author and the profession upon its publication.

So far as we have been able to examine this edition it does not differ largely from its predecessors. Yet there is evidence of the revision and enlargement indicated on the title-page. The enlargement, we are glad to notice, has not materially increased the size of the work. The two volumes of the second edition contained an aggregate of 1595 pages. The two volumes of the present edition contain an aggregate of 1688 pages. This is an increase of less than a hundred pages, and with this increase the two volumes do not make so bulky a work as the first edition. Such keeping within due bounds, such slowness of growth in mere magnitude, we regard as a positive merit; especially in a country like ours, where wordiness is a national sin, and one of which even scientific writers are not wholly guiltless. The subjects treated of in this edition for the first time are chromic acid, permanganate of potassa, the sulphites of soda, carbolic acid, nitrous oxide, rhigolene, and Calabar bean. Of these, the account of the last mentioned article is the most important contribution. It is a model for a text-book or general work on *materia medica* of physiological and therapeutical description. The article on bromine and the bromide of potassium is essentially new, and, on the whole, is the best summary we have met with of what is known about them. It contains the results of the investigations of

M. Voisin, of the recent and admirable experiments of MM. Martin-Damourette, and Pelvet, and the earlier ones of M. Puche. We were disappointed in not finding any account of the bromide of ammonium among the bromides or elsewhere. We also looked in vain for the iodide of ammonium and for iodoform. In the discussion of alcohol we were glad to observe a reference to the recent experiments of Dr. Lombard upon the action of alcohol on animal temperature, and also to those of Dr. Anstie, of London, with regard to its general physiological action and elimination. We did not discover, however, any reference to the late excellent monograph of Legras. At the present time, when the friends and opponents of alcohol, in all its forms, err equally in the extremes of their praise and censure, we are glad to find a calm and scientific discussion of its relation to the human system; and a result arrived at, which will commend itself alike to the physiologist, the physician, and the moralist, though it may be condemned both by the prohibitionist and the free trader in rum.

Dr. Stillé's work is so good that we wish it were better. It compares favourably with any similar treatise in any language. For the use of the medical student and of the general practitioner no better work on materia medica can be found. It states what is known at present of the physiological action of drugs with greater fulness and clearness than any other compendium of materia medica, unless, perhaps, we except Dr. Edward John Waring's book on Practical Therapeutics, and this is often inferior, even in its physiological statements, to the treatise of Professor Stillé. Yet the latter does not present so complete an account of this matter as should be done and might be done. It does not point out the intimate connection between the physiological action and the therapeutical use of each article discussed, nor show how the practitioner must make the first guide him to the last. We are aware that this is no easy thing to do, and that in the case of many agents of the materia medica, science has not advanced far enough to do it at all. Still, a great deal has been accomplished in this direction already; more will be done in the future. The present demand and necessity of rational therapeutics are for the study of medicinal agents from the stand-point, not of their empirical employment, but of their physiological action. We wish that one so admirably qualified for the task as Dr. Stillé is had done this and put it into the work before us. Space might have been found for such statements, without increasing the bulk of the volumes, simply by curtailing or omitting the record of the opinions or of the experiments of a number of practitioners, whose opinions and experiments, however honest or well-meant, are of little value. The physician cares very little to know that M. Sée has given strychnia in epidemic cholera, or that Dr. Johnson has applied it over a blistered coccyx, but it concerns him a great deal to know as definitely as possible what the physiological action, the absorption and elimination, and behaviour of strychnia in the system are, and then he can use it rationally.

We should, moreover, have been glad to have found in this edition some account of articles that are not mentioned in it. Little or nothing is said about oxygen or carbonic acid as agents of the materia medica. Yet Demarquay has written a monograph, of not less than eight hundred pages, on the physiological action and remedial use of these two agents alone. We found no notice of leptandrin or pepsin, or of the hypophosphite of soda, or of the hypophosphite of lime. It would not have been a blemish if some account of these articles, and perhaps of others, had occupied the pages devoted to dracontium and succinum, to armoracia and carota.

We do not mean these remarks as strictures, but only as suggestions. We have been led into them by the great excellence of Dr. Stillé's work (and do not wish to extend them). We have already said more than we intended when we began this notice. Lest we should be misunderstood, let us repeat a previous statement, that we regard this work as the best one on materia medica in the English language; and as such it deserves the favour it has received. The typography of the work is excellent. A copious index, both of diseases and of remedies, facilitates the investigations of the student.

E. H. C.

ART. XXIII.—*St. Bartholomew's Hospital Reports*. Edited by Dr. EDWARDS and Mr. CALLENDER. Vol. III. 8vo. pp. xxiv. 486. London: Longmans, Green & Co., 1867.

WE have no hesitation in pronouncing this volume to be decidedly the best of those which have been so far published by the staff of St. Bartholomew's. In accordance with the custom of this Journal, we propose to offer our readers an analytical and critical review of the various papers contained in the present volume, and cannot but express our gratification at the outset, at finding the large majority of these papers to be of the class which can only originate from the practical experience of a large hospital, and which is, therefore, peculiarly suited to form the bulk of a volume of hospital reports; we refer, of course, to the class of practical papers founded upon the collected clinical records of long series of cases, which, though common enough in hospitals, are rare in private practice, and concerning which our information must, therefore, be almost exclusively derived from the writings of hospital physicians and surgeons.

Before coming to the strictly professional contents of the volume under review, we find a short, but touching and appreciative biographical notice of the late Dr. Henry Jeaffreson, who died when not quite fifty-seven years old, on the 7th of December, 1866. This sketch is anonymous, but evidently written by a friend who thoroughly knew and recognized Dr. Jeaffreson's noble qualities, both as a man and as a physician. Dr. Jeaffreson's untimely death was from typhus fever, the disease having been acquired while assiduously and affectionately nursing a student of St. Bartholomew's Hospital, whose death anticipated that of his kind teacher but by a few weeks.

May we be excused for referring in this place to the sad event of two years ago, which removed from our own community, by the same fatal malady, one who, like Dr. Jeaffreson, was an excellent hospital physician, and successful clinical teacher, and which enrolled the name of CHARLES PENDLETON TUTT in the brilliant but mournful list of medical men, who, as true martyrs to science, have offered up their lives in the ordinary conscientious discharge of professional duty.

Following the sketch of Dr. Jeaffreson, we come to a paper, the importance and practical value of which cannot be overestimated. This is article I.—*Some Statistics of Pyæmia* by WILLIAM S. SAVORY, F. R. S. Mr. Savory, who has since the publication of the second volume of the Reports, become, by the retirement of Mr. Wormald, full surgeon to St. Bartholomew's, is already well known as a writer on pyæmia, from several excellent papers which he has previously contributed to the first and second volumes of the Reports respectively. Valuable as those papers were, however (and one of them gave full details of twenty-seven carefully-conducted, original experiments), they fade in importance and interest before the present contribution to surgery, which gives the histories in tabular form of no less than one hundred and thirty-three well-marked cases of pyæmia. Our readers can form some idea of the extent and elaboration of these tables, when we state that they occupy fifty-four pages, of small type. With regard to the question whether pyæmia be or be not contagious, Mr. Savory concludes that there is no evidence whatever that it is contagious in the sense in which scarlet fever or smallpox are said to be so.

"There is no evidence that the disease depends upon the introduction into the system of any specific morbid matter from without. Nevertheless, there is the strongest evidence that the disease is sometimes due to the proximity of other cases; but the production of the disease under these circumstances may be otherwise explained. Pyæmia commonly supervenes upon foul wounds, or wounds which furnish decomposing matter. Now, such matter may not only be absorbed into the system furnishing it, and thus provoke pyæmia, but, impregnating the atmosphere, it may be carried to adjacent healthy wounds in other persons, and create morbid action in them, whereby foul matter is again formed and then absorbed. . . . Thus pyæmia may be induced by the proximity of any foul wounds or sores, even perhaps by healthy ones if unduly accumulated within a limited area."

Though pyæmia is often spoken of as a disease of hospitals, it is shown by Mr. Savory's tables that many patients are pyæmic at the time of their admission; it must be remembered besides that the disease is more likely to be recognized and recorded when occurring in the wards of a hospital than when met with in private practice; moreover, those patients whose diseases or injuries particularly predispose them to pyæmia, are precisely those who are generally sent to hospitals for treatment.

Of 132 cases embraced in Mr. Savory's tables, the results of which have been ascertained, twenty-six, or 19.7 *per cent.* are known to have recovered, and 106 or 80.3 *per cent.* to have died. "Perhaps pyæmia is not so constantly fatal as these figures may appear to show"—several cases which recovered having been excluded from the tables, as not being sufficiently marked to warrant their being included. The occasional existence of an eruption in cases of pyæmia, presenting a resemblance to the eruptions of the various exanthemata, is referred to; and the remark made that through these cases the analogy of the affection to other forms of blood-poisoning is most clearly seen. Mr. Savory makes no allusion, however, to the very strong likeness between pyæmia and the disease generally known as gonorrhœal rheumatism, but which should more properly be termed urethral or genital rheumatism, as pointed out in the discussions at the Société Médicale des Hôpitaux de Paris during November and December, 1866, and January and February, 1867.¹ (See *Archives Générales de Médecine*, Mars, 1867, pp. 360-371.) We well remember a case which occurred during our residence as house-surgeon at the Pennsylvania Hospital. A young man had been admitted for incontinence of urine, and we were directed by the surgeon on duty to test his urethra for the existence of stricture by passing bougies, beginning with the smallest and proceeding in gradual succession to the largest in the scale. There was no stricture; the largest bougie entered with perfect facility; but our investigation resulted in an attack of pyæmia, which confined the patient to his bed for many weeks, and which was attended with repeated rigors, profuse sweating, and profound debility, though not with the so-called metastatic abscesses, so frequently met with in this disease.

"Pyæmia not only often occurs, as is well known, without the previous existence of any wound, but sometimes, so far as the most careful and complete examination can show, without any previous suppuration or any other local mischief whatever."

With regard to the causation of pyæmia, Mr. Savory says: "These tables yield but little support to any doctrine which assumes phlebitis or even thrombosis to be a necessary link in the chain of causation." In this remark we quite coincide; indeed we think the question has been settled by Mr. Savory's own experiments, reported in his excellent paper "On the Local Effects of Blood-poisoning in Relation to Embolism," in the first volume of *St. Bartholomew's Hospital Reports*. A great deal of confusion is, we think, maintained upon this point, by not recognizing, or by forgetting that the disease, which we must still call *pyæmia* (though mentally protesting against the term as a misnomer), is not necessarily accompanied by secondary abscesses, or indeed by any local changes whatever; while, on the other hand, secondary abscesses may, and do occur without the existence of pyæmia. That the latter part of this proposition is true, and that well-marked secondary puriform collections may be due to a modified local nutrition, brought about through the agency of the nervous system—in fact, by a process of reflex action, we have endeavoured to show in another place. (See *Proceedings of Pathological Society of Philadelphia*, vol. ii. pp. 180, 181.) On the other hand, we think it but right to say, that, excluding cases of manifest absorption of putrid material, (*septhæmia*, *ichorrhæmia*) in which death is often too rapid for the development of any local changes, and in which, when such changes do occur, they are secondary and consequent on the blood-poisoning, our individual experience has tended strongly to confirm the theory of Virchow, which, as is well known, makes thrombosis

¹ Perhaps *urethral* or *genital fever* might be a still better name, as there are cases of the disease in question, where the joint symptoms are of but secondary prominence.

and embolism the precedent and true cause of the so-called metastatic formations.

With regard to the cause of the *rigors* or *shivering* so constantly attendant on pyæmia, Mr. Savory inclines to the opinion that they are "the especial sign of the operation of a poison in the blood." We have too often known "rigors, followed by reaction in the form of increased heat of surface, or of perspiration, or of both," dependent on the simple painless catheterization of a healthy urethra, to be willing to subscribe absolutely to this proposition. We have endeavoured, in the paper already referred to, to indicate what is at least a strong analogy between the rigors accompanying the processes of thrombosis and embolism, and the nervous phenomena so often observed in the sudden obstruction of an arterial trunk by the application of a ligature or otherwise. (*Loc. cit.*, p. 181.)

The treatment generally employed in Mr. Savory's cases seems to have been the use of quinia, with free stimulation and careful nourishment. This we believe to be the only rational mode of treatment, as it has certainly, in our own hands at least, been the most successful.

Art. II., by THOMAS HEAD, M.D., is entitled *Observations on the Nature and Medical Treatment of Obstructions of the Bowels, and upon Constipation*. This paper gives the details of twelve cases of more or less intrinsic interest. The writer seems not to have met with, or else not to approve of, the posthumous volume of the late Dr. Brinton on *Intestinal Obstructions* (noticed in the number of this Journal for January, 1868), or he would scarcely characterize, as he does on page 92, the treatment by calomel, colocynth, and croton oil as "most judicious." One practical suggestion of Dr. Head, which we think worth remembering, is to use injections of *large quantities* (not less than three pints) of warmed oil; a preliminary injection, in cases of irritable rectum, having been made of one pint of water with a few drops of laudanum.

We next come to Art. III., *On Convulsions in Children*, by SAMUEL GEE, M.D. This paper is based upon notes of 102 cases, the convulsions in 24 of these being due to local causes, in 73 to general causes, and in 5 to causes the nature of which could not be determined. In those of the first class the diagnosis was confirmed by post-mortem examination in all but two cases, various intra-cranial lesions being discovered which amply accounted for the symptoms observed during life.

Of the second class (73) no less than fifty-six were in children who were likewise afflicted with rickets, and in all of these the convulsions were of the kind called *essential convulsions* (eclampsy). Moreover, of sixty-one cases of *eclampsy*, fifty-six were these cases of rickety children; hence Dr. Gee draws the inference, which is certainly plausible, that rickets is a predisposing cause of eclamptic convulsions. Of the fifty-six cases referred to (compendious but sufficient notes of which are given), only five proved fatal, and in two at least of these there were concomitant circumstances to account for the result. As Dr. Gee's mode of treatment seems to have been very successful, we quote it in his own words, for the benefit of our readers:—

"The method which was uniformly followed may be divided into two parts: (1) during the actual presence of the convulsions, and for about a week afterwards, to give the bromide of potassium or ammonium in doses of (say to a child of a year old) four grains three or four times a day; (2) when the fits have been absent for a week or two, to begin with ol. morrhue and vin. ferri, continuing the sedative salt or not, according to circumstances."

Art. IV., *On the Relation of Life to other Forces*, by W. MORRANT BAKER, is a paper of considerable interest, and evinces a clearness of thought and accuracy of analysis which incline us to think favourably of the author's mental powers. We regret, however, that this essay has not been communicated to the world as a monograph, or through the pages of a journal such as the *British and Foreign Medico-Chirurgical Review*, rather than in a volume of hospital reports, where, to say the least it finds no appropriate place. We cannot say that we have derived any very new ideas from Mr. Baker's lucubrations, nor any suggestions of sufficient practical utility to warrant our transcribing them for

our readers. Still, we are convinced that papers such as that before us are of value, and the subject is certainly of the greatest interest and importance. Mr. Baker's views we believe to be generally correct, though we think he scarcely lays sufficient stress upon the one process which of itself, to our minds, demonstrates the necessary existence of a special vital force, viz., "*the evolution of form from formless matter*." Those of our readers who may have graduated some years since at the University of Pennsylvania, will remember the emphasis and clearness with which this doctrine was wont to be brought out in the eloquent and brilliant lectures of the distinguished and venerable Emeritus Professor of the Institutes of Medicine in that "*mater matrum*," the mother of the colleges.

In Art. V. we have *An Illustration of Extensive Cancer, traceable to Dispersion from the Primary Tumour, as Distinguished from its Constitutional Reproduction*, by CHARLES H. MOORE. The case upon which this paper is based is narrated at considerable length, and the exact mode of dispersion of the disease from its original locality clearly traced in the account of the post-mortem appearances. This paper forms a strong argument in defence of the view now rapidly growing in favour with pathologists, that cancer is, at its origin, in all cases a local affection; and that hence, when practicable, its early and complete extirpation is *the* mode of treatment (*par excellence*) to be adopted. This doctrine of the pathology of cancer has, we may say, met with no more able advocate than Mr. Moore himself, whose excellent pamphlet *On the Antecedents of Cancer* will doubtless rise in the memory of our readers on the mention of this subject.

Art. VI. is *On the Examination of Patients suffering from Deafness*, by THOMAS SMITH. The writer begins by quoting the dictum of a London professor of surgery, which unfortunately represents but too accurately the state of aural surgery with many practitioners in this country as well as in England: "Gentlemen," said the professor, "there are but two kinds of deafness—the one is curable by syringing, the other is not curable at all."

We cannot pretend to follow Mr. Smith in all the details which are embraced in this very useful and practical paper; we must refer our readers to the original, and content ourselves with directing special attention to two or three points which seem to us of peculiar importance. It is well known that some persons who are ordinarily deaf, hear very well when the rattle of machinery or other loud and continued noise hinders people in general from hearing. This Mr. Smith considers an unfavourable sign in estimating the chances of recovery, for the reason suggested by Kramer, viz., that the abnormal ability to hear, under these circumstances, may depend upon the effects of excessive stimulation upon a very dull auditory nerve, *i. e.*, a nerve that, unless abnormally stimulated, could not be made to appreciate sounds.

The "nervous temperament" (so called) is highly unfavourable to the treatment of deafness. The application of a watch to the bones of the head will usually serve as a test to decide whether the fault be in the auditory nerve, or in the bony and other parts of the auditory apparatus; in some cases, however, this test may fail, from a condition of the nerve analogous to colour-blindness in the eye, which may prevent sounds of that particular calibre from being heard, while others are clearly perceptible. The *tuning fork* is sometimes of value in determining whether an obstruction be in the external meatus or in the cavity of the tympanum, since in the former case the resonance of the instrument is increased when it is applied to the bones of the head. Mr. Smith, we observe, expresses a preference for the conical speculum known as "Wilde's;" this is contrary to our own experience, as we have always thought that of the late Mr. Toynbee preferable, if for no other reason, because less apt to give pain, when introduced into a swollen and perhaps acutely inflamed ear.

The next paper is communicated by Dr. J. ANDREW, and is *On Disease of the Mitral Valve*. The text of this paper is a history of a case of marked mitral insufficiency which improved so much and so rapidly under treatment, as to be fairly classed as an instance of recovery. Dr. Andrew properly lays stress upon one point, which, while theoretically conceding, we are all too apt to forget in

practice, viz., that the *murmur* is of much less importance as regards the probable progress and result of the case, than are the other physical and rational symptoms, which are often passed over, particularly in the hurry of prescribing at dispensaries or in the out-patient departments of hospitals. Dr. Andrew's views as to treatment seem to us so important and so judicious, that we transcribe them in full for the benefit of our readers.

"In the treatment of mitral incompetence there are three principal indications, to the more or less complete fulfilling of which our success will be proportioned.

"1. To diminish, as far as possible, the sum total of the blood in the body; for a heart which is unable to transmit a certain quantity of fluid in a given time, may suffer little or no embarrassment, when called upon to deal with a smaller quantity only. This is best accomplished by a diet nutritious but restricted, especially in respect of the quantity of fluid which is taken. This restricted diet is further advantageous by diminishing the risk of over-distension of the stomach and the consequent mechanical interference with the cardiac and respiratory movements.

"2. To maintain the nutrition of the heart and its muscular power, for by doing so we shall obviate to some extent hypertrophy and dilatation with their attendant evils. The continued use of some preparation of iron—the tinct. ferri perchloridi is, I believe, the best—will be of the most essential service; but if iron cannot be borne, quinine or the mineral acids must be substituted for it.

"3. To diminish the frequency and energy of the heart's action. When regurgitation takes place through the mitral orifice, the more numerous and forcible the pulsations of the left ventricle the greater will be the distension of the left auricle and the congestion of the lungs. The patient must religiously avoid all excitement, fatigue, or muscular effort; but the benefits of rest will be greatly increased by the use of digitalis in doses regulated by its effect on the pulse. With proper care it may be employed continuously for long periods without any untoward symptoms being produced by it. A belladonna plaster on the cardiac region sometimes appears useful.

"By this line of treatment we may often do a great deal more than merely palliate the symptoms of heart disease produced by mitral incompetence. But if it is to be effective it must be persevered in for months, and even years, and, above all, must not be lightly exchanged for measures intended to relieve such symptoms as dyspnoea and anasarca. There is no other class of cases in which the temptation to employ means which yield immediate relief is greater, none in which such temporary expedients inflict more permanent harm. If the nutrition of the heart be once impaired, it is too often impossible to redress the injury thus sustained. Of this a sufficient proof is afforded by the numerous cases in which valvular disease exists for many years without causing any serious annoyance, until on the occurrence of some debilitating disease or of profuse hemorrhage, distressing and fatal symptoms are at once developed."

Art. VIII. is a *Report on the Cases of Cholera treated in the wards of St. Bartholomew's Hospital during the Epidemic of 1866*, by WILLIAM CHURCH, M. B., etc. This paper contains tables giving the statistics of one hundred and thirty-six cases which were admitted to the cholera wards of St. Bartholomew's, eighty-one of the number being actually cases of cholera, and the remaining fifty-five being principally of diarrhoea or colic. Forty-four of the former class and four of the latter proved fatal. One curious fact brought out by these tables is that, while the number of admissions of patients suffering from diarrhoea was nearly equal for each day in the week, in the cholera cases the numbers admitted on Monday and Tuesday greatly preponderated. "I cannot help thinking," says Mr. Church, "that this preponderance in favour of the first days of the week may to a certain extent be regarded as a measure of the increased liability to cholera induced by drunkenness, many of the patients admitting that they had been drinking to excess the day, or for several days, before the advent of the choleraic symptoms."

The temperature was noted in thirty-one cases (twenty-two fatal), and the details of seven observations are given in full. "I should consider that the

temperature falling below 94.95 was an indication that the case was severe and the chance of recovery small." "The temperature was taken by placing the thermometer in the axilla. No attempt was made to ascertain the heat of the body by introduction of the thermometer into the vagina or rectum." We cannot but think that the physicians of St. Bartholomew's did right in thus limiting their thermometrical observations; for we cannot suppose that the ascertaining of the temperature of the vagina in women young and old, married or virgin (as has been practised in at least one English hospital) can add an amount of scientific information at all commensurate with the sacrifice of modesty on the part of the unfortunate patients, to say nothing with regard to that of the doctor who makes the observation.

Tables of the post-mortem appearances in nineteen cases where autopsies were made, are appended, and Mr. Church remarks upon the similarity in these as well as in the symptoms of cases which die during collapse, to those presented by patients who suffer from the effects of irritant poisons.

Art. IX. is a *Note on Dr. Roberts' Method of Estimating Diabetic Sugar*, by PHILIP J. HENSLEY, M. A., M. B., etc. Dr. Roberts' rule, we are told, is as follows: "The urine is fermented by means of yeast, its specific gravity having been previously ascertained. In twenty-four hours when the fermentation has ceased and the scum subsided, the density is again taken, and by subtracting this from the density before fermentation, the 'density lost' is ascertained. Then the number of degrees of 'density lost' indicates as many grains of sugar per fluidounce." Mr. Hensley concludes that "if by 'fluidounce measure' be meant that of the British Pharmacopœia, and by 'sugar' be meant glucose in its crystallizable form, Dr. Roberts' rule gives a number slightly too great, but whose excess above the true number is less than its sixty-fourth part."

The criticism which we offered with regard to Mr. Baker's article on the vital force is even more applicable to the present paper by Mr. Hensley. However excellent in itself it seems to us utterly inappropriate in a volume of hospital reports, and as such we could wish that it had been omitted. Mr. Hensley's conclusion is arrived at by means of an abstruse mathematical calculation, which we forbear to quote for the reason that ninety-nine *per cent.* of our readers would skip it as a matter of course, and the remaining one *per cent.* would receive but very questionable edification from its study.

Art. X. is *On the Passage of Certain Substances into the Urine in Healthy and Diseased States of the Kidneys*, by DYCE DUCKWORTH, M. D., etc. Dr. D.'s experiments have been made with iodide of ethyl (C_4H_5I), iodide of potassium, bromide of potassium, indigo, aniline, logwood, turmeric, and santonine, in the case of healthy kidneys; and with santonine, tincture of iodine, iodide of potassium, oil of turpentine, and oil of juniper in cases of Bright's disease. He has ascertained that in a state of health all the substances enumerated may be detected in the urine after ingestion by the stomach, except perhaps turmeric, as to which drug the results were, to say the least, doubtful. In the cases of Bright's disease experimented upon, the substances employed were sometimes detected in the urine and sometimes not: the difference apparently depending on the amount of renal structure affected by the disease.

Dr. Duckworth has found santonine to be easily exhibited, the least unpleasant of all the substances employed, and yielding its action very markedly, even if in the smallest amount. Hence it might be usefully employed as a kind of prognostic test: "The majority of cases in which santonine passed belong to a class which, though we are not perhaps entitled to call them absolutely recoverable, are nevertheless greatly benefited by rest, mild diuretics, and the prolonged use of steel. . . . It is to be noted that in the three cases in which it was not discovered, the dropsy is mentioned as extreme or severe." In one at least of these, death followed a few months after the experiment.

Art. XI., by AUGUSTIN PRICHARD, gives two successful cases of ligature of the external iliac artery for aneurism. In the first case the femoral artery of the opposite limb had been tied four years previously, likewise for aneurism. The ligature of the iliac was followed by suppuration of the sac and a long train of

untoward symptoms the nature of which is not very clearly defined, recovery with a useful limb eventually being obtained. In the second case, recovery was uninterrupted. We observe that Mr. Prichard speaks of employing compression before the operation with a view to promote the establishment of the collateral circulation. We believe this to be unsafe surgery: the risk of gangrene after operations for aneurism is (as has been shown over and over again) *not* from diminution of the arterial supply, but from *venous congestion*, a condition which is always aggravated, if not originally induced, by the preliminary use of compression.

Art. XII. is a paper of unusual interest and importance. It is entitled *Remarks on all the Principal Cases of Injury of the Head admitted into the Hull General Infirmary during the Six Years from 1858 to 1863, inclusive*, by CHARLES JEWEL EVANS. Forty cases, principally of fracture, are detailed in a table the elaboration of which may be inferred, when we state that it occupies no less than thirty-eight pages. "No cases of scalp wound or other injury of the head, however severe—provided they were not followed by concussion or inflammation and its results ending fatally, or accompanied with fracture—are included in the table." Eighteen of the forty cases recovered, while twenty-two proved fatal. All with one exception were in males.

This table is of great value, and will well repay a careful study. Mr. Evans in his remarks takes up *seriatim* the following points, viz., the question of treatment, the discharge of serous fluid from the ear, facial paralysis, the state of the pupils, the state of the respiration, and the condition of the pulse.

With regard to the use of the trephine, he says: "The cases just recorded in which operative measures were employed, are not sufficiently numerous to make any deductions from them of much value; the few, however, which are related in the table go to confirm the opinion—now, I think, generally entertained—that the operation of trephining is not one from which a hopeful result may be often expected." [The trephine was used in six cases, five of which proved fatal, and in the sixth, facial paralysis, which seems to have been the indication for the operation, still persisted at the time of the patient's discharge ten weeks subsequently.] While upon the subject of the operative treatment of injuries of the head, Mr. Evans quotes (we are glad to say with approbation) some remarks of our own on the matter in question, published in the number of this *Journal* for October, 1865, p. 390, and republished in the *Biennial Retrospect of the New Sydenham Society* for 1867.

Mr. Evans believes that the serous fluid discharged from the ear in cases of injury of the head is always of cerebro-spinal origin, and is therefore pathognomonic of the existence of fracture. We deem it but right to say that we think the united testimony of Mr. Prescott Hewett and of Mr. Holmes, that they have actually seen such a discharge in cases where there was no fracture (as proved by *post-mortem* inspection) communicating with either internal or middle ear, and no communication between those cavities, must be considered as establishing at least the possibility of this fluid originating in the tympanic cavity itself. [See *Holmes' System of Surgery*, vol. ii. pp. 131 *et seq.*]

Facial Paralysis, together with hemorrhage from the ear, Mr. Evans likewise considers an evidence of fracture. That aural hemorrhage may occur without fracture has been seen in many cases, among others in one published by ourselves in the *Proceedings of the Pathological Society of Philadelphia* (vol. ii. p. 149); while the existence of paralysis, we think (though we have no observations to prove it), might be accounted for in other ways, even in those cases where it could not be due to extra-cranial nerve injuries. It is true, as Mr. Evans observes, that "lesion of that part of the brain where the nerve takes its origin would probably be attended with immediate paralysis; and further . . . that if this arose from inflammation of the nerve itself it would not gradually pass off as it so frequently does." The gradual formation of a small cerebral clot might, however, we conceive, give rise to the tardily occurring paralysis; while the contraction and partial absorption of the same clot, which would ensue if the hemorrhage ceased and life was prolonged, would naturally permit the diminution and gradual disappearance of the paralysis which it caused.

Although we have thought it right to express our dissent from Mr. Evans' conclusions upon these points, which after all are of very little practical importance, we cannot but thank him for his highly valuable contribution to a branch of surgery which still merits more accurate investigation than it has yet received.

Art. XIII., by W. AINSLIE HOLLIS, M. B., etc., is *On the Value of the Thermometer as an Aid to the Physician*. This paper strikes us as being both practically valuable and well timed. There is no doubt that any brilliant discovery of a new means of physical investigation is very apt (from the constitution of the human mind) to be at first lauded more highly than it may deserve, afterwards perhaps to relapse into still more unmerited neglect. It is in view of this fact that Mr. Hollis has endeavoured to show, in the paper before us, that while the utility of the thermometer as a means of diagnosis and prognosis is indisputable, it must not be exclusively relied upon. We recommend the perusal of this article to our readers, but must confine ourselves in this place to two short quotations: "As a rule," says Mr. Hollis, "even in acute diseases, I rarely exceeded a single observation daily; in chronic cases one or two observations a week were usually sufficient. . . . I cannot allow this subject to pass without strongly reprobating the practice of taking in severe cases several (sometimes even hourly) observations in the day; this 'mimia cura medici' (if worthy of the term) can do no commensurate good to science compared with the inconvenience, not to say distress, which it occasions patients who have to submit to it."

"In conclusion, I trust that I have succeeded in showing that thermometric registrations by no means supersede or lessen the value of careful observation of the general symptoms of disease; that variations of temperature may be caused by numerous morbid and vital processes acting simultaneously; and that the real value to be assigned to any given temperature must depend entirely upon a due consideration of the processes which have given rise to it."

Art. XIV. *Extraordinary Anomalous Affection of the Nervous System in a Boy*, by LUTHER HOLDEN, is sufficiently described by its title. The case is exceedingly interesting and is well described. Fortunately for the boy in question, though unfortunately for the cause of science, the anomalous affection of the nervous system from which he suffers gives no immediate prospect of a fatal result; wherefore Mr. Holden, as well as his readers, must remain for the present in ignorance of the true pathology of this curious case.

Art. XV., by PHILIP CHILWELL DELAGARDE, is entitled *Surgical Cases, Devon and Exeter Hospital*. This paper, which may be regarded as a sequel to one which appeared under the same title in the second volume of the reports, we have found of much interest, though its utility is impaired by the want of an index to the volume, which the editors have apparently not thought proper to furnish. A considerable number of cases of cancer are detailed, and the histories of other cases of the same disease which were published in Mr. Delagarde's previous paper are brought down to date.

The author, differing from Mr. Moore and other recent writers, believes in the existence of a *cancerous diathesis*. His practice is not, however, at variance with that of the advocates of the "local origin" theory, for he thinks that by an early and complete removal of the diseased tissue "we may not unreasonably hope for a cure—a cure in so far permanent that the diathesis may not originate another cancerous centre during the remainder of the patient's life. Be it remembered that this latent diathesis, not uncommonly, has been rendered sensible, and has been as it were localized by some external violence, without which there might have been no cancer at all."

Art. XVI. is *On Tracheotomy in Children; its Methods, its Dangers, and its Difficulties*, by F. HOWARD MARSH. "I am convinced," says Mr. Marsh, "that tracheotomy should be regarded as a delicate operation, which requires coolness and caution in its performance, rather than as one that is necessarily either very difficult or very dangerous."

In the very large majority of cases, the surgeon has time enough to perform

the operation with as much deliberation as would be employed in either herniotomy or the ligation of a large artery, such as the femoral; and when the operator "makes haste slowly," which he should always do when practicable, he can avoid the dangers of hemorrhage, etc., and render the proceeding as an operation equally harmless with either of those referred to. *Tracheotomy* should always be performed in preference to *laryngotomy*, but whether the opening be made above or below the isthmus of the thyroid gland, is generally a matter of small importance, and may depend upon the disposition of parts in any particular case, or upon the convenience or even fancy of the operator. It is generally stated that the tube worn should be as large as possible; this the author maintains (and we think with reason) to be an erroneous doctrine. It need never be of greater size than the diameter of the cricoid cartilage, which is almost invariably less than that of the trachea. Mr. Marsh recommends the introduction of the tube employed by Dr. Fuller, and known as the "bivalve canula," immediately after the operation; but prefers the ordinary French instrument as a more permanent apparatus, to be substituted for the former on the second day. Full particulars are given as to the steps of the operation, and as to the after-treatment of the patient; and the paper is concluded by the narration of eleven cases illustrative of the various points brought forward in the body of the essay.

PROFESSOR TURNER, in Art. XVII., gives the description of an interesting specimen of *Anchylosis of the Atlas to the Occipital Bone, and of Dislocation and subsequent Anchylosis of the Atlas and Axis*. The author begins by referring to similar specimens in St. Bartholomew's Hospital Museum, and in that of the Middlesex Hospital. He then proceeds to describe the preparation which forms the subject of his paper, and which is to be found in the anatomical museum of the University of Edinburgh. In this specimen, "owing to the backward displacement of the axis, the anterior surface of its odontoid process was separated from its articular facet on the ring of the atlas by an interval of $\frac{3}{16}$ ths of an inch, whilst the distance between its posterior surface and the posterior ring of the atlas was little more than $\frac{1}{16}$ ths of an inch. The spinal canal was therefore divided into two portions, through the posterior and smaller of which the spinal cord and its membranes had been transmitted. The transverse diameter of the posterior portion was also reduced to $\frac{1}{16}$ ths of an inch. From the great diminution in size of the canal in this locality, the cord must either have been considerably atrophied, or much compressed in the antero-posterior direction." Unfortunately there is no history of the patient from whom this specimen was derived. We could wish that Professor Turner's paper were accompanied by a plate or wood-cut, for to nothing does the Horatian maxim, "*Segnius irritant*," etc. apply with greater force than to mere printed descriptions of anatomical preparations.

Art. XVIII. is *A Discussion of the Mechanical Theories which have been advanced to account for the Origin of Pulmonary Emphysema*, by PHILIP J. HENSLEY, M. A., M. B., etc.

It is said that the first step towards knowledge is a willingness to confess ignorance. In this point of view, Mr. Hensley has certainly added to our information, only, however by having rendered it pretty certain that none of the ordinary theories as to the production of emphysema are tenable.

MR. J. ASTLEY BLOXAM contributes Art. XIX., *Respecting the Treatment of Fractures of the Lower Extremities in the Wards under the care of Mr. Paget*. Fractures of the thigh in young children are treated by position only, no apparatus whatever being employed. Fractured patellæ in patients of all ages are treated merely by extending the limb, and placing a sand-bag on either side for support. Fractures of the thigh in adults are treated in the manner recommended by Prof. Hodgen, of St. Louis, which appears to be essentially a modification of the anterior splint of Prof. Nathan R. Smith, of Baltimore, with the superaddition of the ordinary adhesive plaster extending apparatus, which is here called "Swinburn's." Fractures of the leg below the knee are treated with the immovable bandage of plaster of Paris, or, in severe cases, with a rather complicated suspension apparatus, which is not very clearly described.

"Should the fragments not come readily into position and remain there, the tendo-Achillis is divided; and this is almost invariably done in oblique fractures, and in those near the ankle-joint with much displacement. If the fracture is compound, the tendo-Achillis is always divided," etc. In a not very limited experience of the treatment of fractures of the tibia and fibula at the Pennsylvania Hospital and Episcopal Hospital of this city, we have never found this operation necessary, nor can we recall any case in which its performance has been even suggested; hence, with all due respect for Mr. Paget's opinion, as shown by the practice pursued in his wards, we cannot but think the number of cases of fractured leg which call for tenotomy, less than would be indicated by the paragraph which we have quoted.

Art. XX. gives a *Case in which a Large Hydatid Cyst was removed from the Chest, with ultimate Complete Recovery*, by REGINALD SOUTHEY, M. D., etc. This case is, we need scarcely say, one of very great interest, and is very fully and accurately reported.

Art. XXI. embraces *Some Cases of Disease of the Brain*, by JOHN CROCKETT FISH, M. B., etc. Three cases of tuberculous meningitis, one of the simple acute variety of the same disease, and one of abscess of the left lobe of the cerebellum (following upon otorrhœa, with disease of the petrous portion of the temporal bone) are detailed, and the post-mortem appearances in each case described. A few practical remarks are added, with a view of throwing light especially upon the question of diagnosis. There is nothing particularly remarkable in this paper, and yet we have examined it with both pleasure and profit, and think our readers might do the same. The next best thing to case-seeing is case-reading, and he who accurately describes a case (no matter how simple or common-place it may be) is, in our opinion, entitled to a hearing, and is worthy of thanks for having added *something*, although it may be very little, to our common stock of positive information.

Art. XXII., by Mr. PAGET, *Senile Scrofula*, is very short, but full of valuable practical hints and suggestions. The diagnosis between scrofula and cancer, in old persons, is often difficult, though its difficulty is increased by the too prevalent impression that senile scrofula is very rare. With regard to bones and other structures not glandular, it may be observed that redness of surface, tenderness, and local heat, indicate scrofula rather than cancer; while spontaneous pain, if severe, indicates the latter disease rather than the former. "In the diagnosis between scrofulous and primary cancerous lymph-glands in the old, the chief things indicative of cancer are hardness or at least great firmness of substance, close-clustering, deep-seated attachments, pain, and quick increase. The opposites of these conditions, especially when tenderness and external redness are added to them, commonly signify scrofula."

The treatment of senile scrofula should be the same as that for scrofula in the young, though it must be acknowledged that the prospect of benefit is much diminished by the element of age.

We have in Art. XXIII., by Mr. CALLENDER, the first part of what will form when completed a most valuable contribution to our knowledge of *The Anatomy of Brain Shocks*. The whole paper will contain the records of one hundred fatal cases, the post-mortem examinations of which were carefully made during the years 1849-59 by the writer and the late Dr. Kirkes. Mr. Callender divides his cases into three distinct groups, viz:—

"1. Cases in which pressure on the surface of the brain or on the walls of the ventricles has been the apparent cause of death.

"2. Cases in which various portions of the brain have been destroyed by disease.

"3. Cases in which there has been bleeding into various parts of the substance of the brain."

The present instalment of Mr. Callender's paper, which contains forty-seven cases, disposes of the first group, and begins the consideration of the second. Perhaps the most striking point brought out in the pages now under consideration, is the coincidence of convulsive movements with the lesion of the parts

around the corpus striatum, whether from disease of the brain itself, from abscess or bleeding into its tissue, or from the existence of aneurism of the middle cerebral artery.

With regard to the treatment of cases where hemorrhage has taken place upon the surface of the brain, Mr. Callender says: "And here let me add that I would thoroughly confirm the observations of Mr. Prescott Hewett, when he states that he has seldom seen trephining of use in these cases, or in cases of depressed fracture of the bones of the skull, such depression rarely if ever giving rise to the symptoms of compression, extensive hemorrhage, or laceration of the brain usually coexisting. I have never seen an instance in which compression could be assigned solely to such a cause, and the best proof of the rarity of such an occurrence is to be found in the fact that trephining and bone raising for these injuries to the bones of the head have not been practised by the surgeons of St. Bartholomew's during the past six years."

Art. XXIV., by HOLMES COOTE, gives the history of a very interesting case of traumatic femoral aneurism (arterio-venous) in which pressure was employed with, at first, the prospect of a good cure; subsequently, however (through the rough examination of some visitor to the hospital, equally inconsiderate of the patient's good and of the laws of professional courtesy), the pulsation returned and the limb became so swollen and painful that suppuration of the part was feared. The Antyllian operation (laying open the tumour and tying the vessel above and below) was now performed, and eight days later the thigh was amputated for secondary hemorrhage, the patient, however, sinking a few hours after the latter operation. In the *Transactions of the Philadelphia College of Physicians*, for Feb. 1, 1865 (vol. iv., n. s., pp. 137-141), may be found a somewhat similar case reported by ourselves, where the "old" or Antyllian operation was performed for traumatic aneurism of the brachial artery, secondary hemorrhages afterward necessitating amputation at the shoulder-joint, and the patient eventually dying of sheer exhaustion and loss of blood.

We are no advocates for the use of pressure in any case of aneurism where the ligature can be applied with a reasonable prospect of success; least of all should we be disposed to dally with compression in cases of a traumatic origin; in these we believe the question of treatment to lie between immediate amputation and the Antyllian operation, of late so brilliantly illustrated by Prof. Syme, of Edinburgh. The latter procedure, though far from being free from risk, presents, of course, the great advantage that it offers a prospect of saving the limb, and for such an object almost any risk is justifiable. Amputation would, however, be the safer remedy; and if the patient, upon a full comprehension of the state of affairs, should give his consent to its performance, it would, in our opinion, be the proper mode of treatment for adoption.

Art. XXV. and last, is called *The Hospital Statistics*, and gives five tables and two sub-tables, selected from the annual report of the Registrars, Dr. EDWARDS and Mr. WILLETT. These tables are of much interest, and are printed under the following headings. 1. Showing the whole number of medical cases under treatment, with the results. 2. Showing the whole number of surgical cases under treatment, with the results. 3. Sub-table of fractures and dislocations. 4. Sub-table showing total number of cases of erysipelas, pyæmia, etc. 5. Statement of disease occurring within the hospital in patients admitted for other diseases. 6. Disease occurring within the hospital—sub-table complications. 7. Causes of death in thirty-seven patients after operation.

We have thus concluded our examination of the third volume of St. Bartholomew's Hospital Reports, and think our readers will agree with us that it is not only the best of its series, but unsurpassed by any similar work in the whole range of medical literature. The papers, with very few exceptions, are just what are wanted in a volume of Hospital Reports, and even those exceptions, though out of place in their present association, are of no little intrinsic merit. We miss the lithographic plates which we have been used to in the other volumes of the series, and hope that in the future the editors will not neglect these, while at the same time they omit not the weightier matters of sound doctrine and practical teaching. We want also an *index*; if the contributors

to the Reports realized how much oftener their papers would be referred to and quoted, and how much wider, therefore, would be their sphere of usefulness, *with* an index than *without*, we are sure that the future volumes would not be deficient in this great desideratum.

J. A., Jr.

ART. XXIV.—*Die krankhaften Geschwülste. Dreissig Vorlesungen, etc.* Von RUDOLF VIRCHOW, etc. Zweiter Band. Zweite Hälfte. 8vo. pp. 468. Berlin: Hirschwald, 1865.

Morbid Tumours. Thirty Lectures, etc. By RUDOLF VIRCHOW, etc. Vol. II. Part 2. 8vo. pp. 468. Berlin: Hirschwald, 1865.

IN the numbers of this Journal for January and April, 1865, we presented a *résumé* of such portions of the above work as had then appeared. An apology may seem necessary for so long an interruption in the task we then proposed, and it is found in the delay which has attended the publication of the work itself. We had hoped that the concluding portion of the third volume would have been given to the world long since, and that we might consequently pursue the course we had marked out to its end. But the work remaining still incomplete, and the amount of material accumulating upon our hands, we offer the reader another instalment, in order that, at all events, our proposed plan may not be lost sight of. In the last article, above referred to, we were considering the nineteenth lecture, upon sarcomata, and had noticed their variety, structure, development, course, and prognosis.

We now proceed to take up the sarcomata as they affect the different organs of the body. And first the sarcomata of the bones. These are not designated as osteo-sarcoma—a term reserved for such as resemble more nearly the osteoma. They are divided into two groups—the periosteal or outer, and the inner or medullary; the former are hard, and in them the bony structure is preserved, becoming sometimes even eburnated; the latter are soft, and in their development the bony structure vanishes entirely, or a thin shield of bone alone is left. The capacity of developing ossific processes may be inherent in both, but the periosteal variety presents a bony basis with radiating shoots, while the most marked cases of the medullary form present only a bony shell or cyst, or a meshwork of bone. These distinctions were well marked by Sir Astley Cooper, and our author agrees with him that in one case the periosteum and in the other the medulla is the starting-point of the process, but differs from him in maintaining that the substance of the bone itself becomes involved sooner or later, so that in many instances it is merely a matter of choice whether they shall be designated as periosteal or medullary.

The periosteal sarcomata are divided into three varieties—fibro-, chondro-, and osteoid sarcoma. Their growth commences in the interior layer of the periosteum, the outer layers of which often continue for a long time as a sort of fibrous covering, thus preventing and retarding the growth. The cortical substance of the bone at first remains smooth beneath the tumour, but it soon becomes uneven, as the tumour attacks its surface and produces alterations in its structure to a given depth. If the tumour is situated over cortical substance of some thickness, as in the diaphyses of the long bones, its progress will be interrupted to some extent; if, however, it is situated upon their cancellated structure, as in the epiphyses of the long bones, it will soon extend to the medullary cavity, and then it becomes very difficult to distinguish a periosteal from a medullary sarcoma. The shape of the cells is quite various. The elongated cells are the most common, especially in the external layers; sometimes, however, the whole tumour will seem to be made up of these alone. Sometimes an intercellular substance is almost entirely wanting, and again it may be so developed as to recall the structure of fibroma. In the softer varieties the round cells are found, but more rarely and less diffused. Stellate and reticulate cells are also seldom found in the softer layers, and then not well pronounced; they are quite perfect in the vicinity of the periosteum, and most numerous in the osteoid

and osseous parts surrounded by a thick, close cartilaginous or calcareous matrix. Multi-nucleated cells are often found, but they seldom attain the size of really giant cells. When they do, they indicate a tendency to the formation of medullary spaces in fibroid or osteoid layers, as is the case in the periosteal sarcoma of the maxilla, called epulis. These varieties of cells are frequently united in the same tumour, and clearly-marked types are seldom found among periosteal sarcomata. Although these tumours begin in the periosteum, they soon attack the outer surface of the bone, and still later the neighbouring soft parts. It is on account of this progressive infection that a superficial removal of the tumour is so often followed by a local recurrence either upon the bone or in the soft parts. This capacity of infection may also assume the form of a metastasis. The author narrates three cases which he has observed of this metastasis in periosteal ossifying sarcoma of the bones. Metastasis may occur either through the circulation of the lymph or of the blood. These tumours are distinguished from all others by the regularity with which the metastasis affects the lungs. They are also often removed without any recurrence and without metastasis. The author has seen one case of an amputated thigh in which after twenty years there has been no sign of any recurrence. If the tumour is removed sufficiently early—before there are secondary developments in the soft parts, before any infection has taken place—then there will be every chance of a successful result. The periosteal sarcoma of the maxillary bones offers a more favourable prognosis only because in this case the operation is undertaken earlier than it is likely to be when the bones of the extremities are the seat of the formation. The prognosis is good so long as the tumour is bounded by the layer of periosteum and the supervening fascia, but it becomes in the highest degree questionable so soon as the soft parts around the periosteum and fascia are infected. In the latter case the tumour not only grows with great energy, but the cells begin to develop increased action.

The history of epulis sarcomatosa (the term being applied to the tumour of the alveolar processes) is of special interest with reference to prognosis in periosteal sarcoma. It is composed of elongated and gigantic cells with many nuclei and of various shapes, thus partaking of the joint characteristics of fibro-plastic and myeloid elements. These latter cells are not true medullary cells, but they are hetero-plastic in their nature. They spring originally from the growing elements of the periosteum, which gradually enlarge, and increase the number of their nuclei; while other elements are transformed into ordinary elongated or reticulated cells, into cartilaginous or ossific corpuscles. But this heteroplasic origin by no means renders the tumour in a strictly clinical sense, malignant. The author cannot recall a single case where the process has spread from an original epulis to an internal organ by metastasis, or where even it has advanced to the nearest lymph-glands. But, on the other hand, there is a local malignity manifested in the excessive capacity of reproduction and by the progressive character of the growth. It is a well-established fact that the superficial removal of epulis is promptly followed by a recurrence, and this last grows much more rapidly than the original tumour. Each recurrence retains the microscopic character of the original tumour entirely unaltered. As a rule, the recurrence takes place when the extirpation of the tumour is not accompanied by the removal of the corresponding portion of bone. The tendency to advance is shown in the ever-increasing portion of the bone involved, both as to its surface and as to the deeper portions of the osseous substance. The development usually commences between the teeth, and especially between the back teeth of the upper jaw, and from this point it may extend over a great part of the side involved. The growth becomes more and more prominent, and is at first painless; then it becomes vascular; and later it may ulcerate and bleed, become disorganized and painful. Still even the worst cases may offer a favourable prognosis, if a sufficient quantity of the bone is removed.

The medullary osteoid sarcomata, or those developed upon the inner surface of bone, in distinction from the periosteal forms which we have been considering, present a marked difference in their appearance. They are, as a rule, chiefly of a soft tissue, which is often also highly vascular, even anastomotic; while, on the other hand, the osseous tissue is either entirely wanting, or exists only in the

form of a capsule or shell, or, more rarely still, permeates the tumour as a sort of network. These tumours correspond to many of the old descriptions of *spina ventosa* and *fungus*, and in more modern times the most of them have been considered cancers; latterly the name of myeloid tumour has been applied to them. They proceed, indeed, from the medulla—and hence the term *myelogen*—but they are rarely developed from the medullary cavity. It is generally the spongy bones or portions of them that suffer. Thus, in the long bones it is the articular extremities, in the flat bones the diploe of the cranial and pelvic bones, the bodies of the vertebræ, the small bones of the hand and foot, and the spongy substance of the maxillary bones. They are developed more frequently about the time of puberty, and hence the inference is fair, that the developing medulla is the place of predilection. This, however, is an exception to the general rule of sarcoma, since, as has been previously stated, the sarcomata belong, as a class, to the later periods of life. They are not merely a hyperplasy of the medulla, for then we should have either a myxoma or a medullary osteoma, growths already described, and from which those we are now considering are distinguished by the abundance and richness of the cells, and often by the excessive development of elongated cells, which certainly do not belong to the ordinary elements of the medulla. But it must be allowed that the myxoma and the medullary osteoma may furnish a basis for the development of this form of sarcoma.

The medullary sarcoma having a thin shell is that commonly described as cysto-sarcoma or as a myeloid tumour. It is found chiefly upon the ends of the long bones, especially at the articulating surfaces of the knee-joint, both in the femur and the tibia, at the head of the humerus, and at the head of the ulna. It is sometimes enormously large, of an irregular globular aspect, and in size bearing no relation to the bone from which it proceeds. These tumours are sometimes completely covered with a thin shell of bone; on the other hand, and almost invariably when of very large size, there are soft spots which may fluctuate and even in some cases pulsate; in such spots the interior mass has broken through the bony shell. The interior mass may be atheromatous or perfectly soft; in the latter case it is red and highly vascular, and sometimes even there may be hemorrhagic deposits. The bony rim is formed by a new superficial deposit of bony matter proceeding from the periosteum. The tumour is sometimes traversed by thin bony partitions, so that distinct lobes may be observed each with its own shell wall and soft interior structure. The bony portion of the tumour is, therefore, chiefly a new formation, and of a thick compact character, sometimes like ivory, and corresponding in structure to the normal characteristics of the cortical substance in bone. The soft portions of the tumour are composed, to a greater or less degree, of the giant cells, and some sections seem to be made up entirely of these; but they are never the only constituent, and we find besides caudated cells with and almost without intercellular tissue, and small round cells; very often, too, a portion of the elements have become completely transformed into fat. There are also forms of medullary sarcoma without a bony shell, and these it is difficult to distinguish from the cancer of the bones, indeed they are often confounded together, cancer considered as sarcoma, and *vice versâ*. Especially is this true of the carcinoma fasciculatum.

As to the prognosis of these tumours there is much difference of opinion. It has been already remarked that epulis, aside from its local malignity, gives no cause for suspicion, but it should be extirpated comparatively early. The myeloid tumours with the giant cells of many nuclei cannot be considered as non-malignant. These cells are hetero-plastic elements and not hyper-plastic. The giant-celled sarcoma of the bones produce a local infection and develop hetero-plastic nodules in their proximity. They resemble in character the fibro-plastic tumours, the possible malignity of which is no longer doubted. On the other hand, the majority of these tumours by free and complete extirpation give such favourable results that they may be almost considered benign. But in practice it is well to lay it down as a rule, that in every sarcoma there is a period when it is more local, and in so far innocent, in which it is advisable to operate, but that each may take on a capacity of generalization, and hence be-

come malignant. In other words, an early and complete removal is the only safeguard against recurrence.

We pass to the consideration of sarcoma of the breast. It may affect only certain portions of the gland or its entire extent. In the former case, which is the more common, it shows itself as a nodule, more or less lobulated, at first readily movable beneath the skin; in the latter, which is the more rare, it is a diffused enlargement, resembling hypertrophy, and of very considerable size and weight. Tumours as large as one's head and larger are not exceptions. They may have a rough nodular surface, or they may be as smooth as a capsular lipoma. The point of departure of these tumours is most generally from the lacteal sinus and the ducts in the vicinity of the nipple, more seldom from the periphery of the lobules of the gland. They have a tendency always to local infection, and gradually involve the surrounding adipose tissue, sometimes developing in it larger masses than in the gland itself. The skin is soon involved, as is indicated by the adhesions formed, and becomes permeated in its entire thickness by the new formation, until at last it is broken through, and ulceration ensues. The tumour is locally malignant in so far as, like all heteroplastic formations, it equally attacks structures composed of the most varied elements. The same course may be apparent, whether the tumour be of the solid or of the cystic variety. The former are generally situated more in the periphery, the latter in the centre of the gland. The largest tumors are, as a rule, of the cystic variety. The tissue of these tumours, after they have attained any size, is quite varied. Here and there it has a firm whitish almost fibrous character; elsewhere it is soft, moist, transparent, even gelatinous; and again it has a soft, whitish medullary, or else a reddish or dark reddish appearance. Some of these characteristics might justly lead to the suspicion of a fibroma or myxoma, but the abundance of cells determines the sarcomatous character. The cells themselves are caudated or alveolar or round, the latter by far the most frequent.

In the cystoid forms the cysts vary in size from that of a hemp seed to that of a walnut and even larger. The walls of the cysts are sometimes so compressed that they appear in a transverse section like fissures. The contents of the cysts are sometimes pure serum, or a milky substance mingled with fat globules, or more gelatinous and very glutinous. Sometimes hemorrhagic deposits are added to these, giving a reddish or, after longer continuance, a brownish or greenish appearance, and in the latter case crystals of cholesterolin are not unfrequently found. These cysts are sometimes empty, or they may contain solid outgrowths from the wall, like warts or polypi, and they may even be filled with these outgrowths. A section of these solid contents will present very much the appearance of the *arbor vitæ* of the cerebellum. As these increase, the walls of the cysts become thinner and thinner, till at last they perforate it, and appear upon the surface like fungoid ulcerations.

The sarcoma of the breast is generally, though not always, a disease of the earlier years of mature life. They begin to grow shortly after the period of puberty, and then advance regularly or with periods of interruption until they arrive at, perhaps, the most colossal dimensions. By both these characteristics they can be distinguished from cancer, which belongs rather to the later years of life, and seldom reaches a similar size. Their extirpation is generally followed by a successful result, but still they are sometimes reproduced even in the scar of an operation. This is not to be wondered at when we remember that there is a local infection; and that, on the other hand, the reproduction may be due to the growth of an independent nodule which existed at the time of the operation, and which was allowed to remain. But the malignancy of sarcoma of the breast is not limited to a local recurrence. The axillary glands, indeed, remain untouched, the reverse of which is true in cancer, but metastases to the internal organs, especially to the lungs, do occur. The author considers it as established, that sarcoma of the breast possesses a limited degree of malignity, but still a perfect capacity of metastasis.

The occurrence of a veritable sarcoma in the ovary is one of the greatest rarities; the tumours generally so considered are, according to the author's view, cystoma.

We have lingered long over this lecture on account of its inherent worth and

the exposition it gives of the author's whole system of onkology. Much of it, of course, we have been obliged to pass over. As the author says, on no other point have theory and practice fought harder battles than on this whole subject of sarcoma, and no other possesses such difficulty in diagnosis. As the final practical suggestion, the author recommends an early operation in all cases.

The next lecture is upon granulation tumours: these are made up of elements of a transitory character; and decay, softening, and ulceration are the necessary termination of their existence. The location of the tumour is of little importance, quite the opposite of sarcoma, and it is less so the more the affection assumes a general character, developing multiple eruptions. Then the inflammatory character of the process is most clearly manifest, and it is impossible to distinguish between inflammation and the formation of the tumour. It is generally in the connective and similar tissues that the development commences. There is first cell proliferation, then hypertrophy, followed by the development of new nuclei or nucleation; the cells then divide up and as the acme of development there are numbers of small cells, mostly round, with large nuclei, which have a certain similarity to the so-called lymph cells. If the tissue is cut or torn, we see a large number of free, round or slightly oval, pale, granular nuclei with one or more nucleoli. Hence it is evident that we have cellular tissue of a low type slightly developed. Sometimes these small cells undergo no further development, and an early retrogression sets in. At other times, the cells attain some size, even that of the mucous corpuscles. Upon the edges of the tumour we may find the well-known elements of the ordinary connective tissue, anastomosing, cuneiform and star-shaped cells, surrounded by more or less intercellular substance. The one important fact, however, is that it is a development of a low perishable order of tissue; the richer it is in cells, the more specific is it; and the more numerous the cells, the smaller are they and the less developed. There are three varieties of tumours which the author brings together under this head. The first is the gummy tumour, developed as the specific product of syphilis; the second, lupus; and the third, elephantiasis Græcorum, or lepra Arabum, leprosy.

The gummy tumour is, of course, acknowledged to be the result of constitutional syphilis; it appears in nodules like lupus and elephantiasis; in former times it was even called syphilitic tubercle. The name syphiloma, used by Wagner, of Leipzig, is not applicable, because there is a whole series of syphilitic tumours, *e. g.*, syphilitic exostosis, which are not gummy tumours. The syphilitic hyperplastic formations are altogether different from these. In the course of syphilis there are two distinct series of productions. First, those which, as we have said, are purely hyperplastic, which, in other words, develop in every tissue homologous products; in bone, osseous tissue; in an organ containing connective tissue, the same tissue; in a lymph gland, lymphatic elements in increased quantity, and so on. These do not belong positively to a given period in the disease, but they denote the more simple and slighter degrees of irritation. Some of them are manifested in the secondary and some in the tertiary periods; indeed, syphilographers have not yet come to an agreement as to the chronological arrangement of these formations. Exostosis or hyperplasy of bone is generally regarded as a tertiary and angina or hyperplastic enlargement of the tonsils as a secondary phenomenon; and yet the angina has the same relation to the tonsils that the exostosis has to the bones. It is not to be denied that in the course of syphilis some local affections appear earlier and others later; this fact was recognized by the oldest writers on syphilis. But the more rigid chronological divisions of later days do not harmonize with experience, for it must be confessed by all that sometimes tertiary phenomena are found in the secondary period, and *vice versâ*. This much is true, however, that there is a certain regularity in the succession of the organs affected. Thus, the infection proceeds from the chancre, the syphilitic mother nodule, to the lymphatic glands, then to the external organs, and then to the internal organs (visceral syphilis). Nor is this rule absolute, but yet it is true in the majority of cases. As to the form of the disease affecting the different organs we may distinguish a graver and a lighter, and, in general, it may be said, that the more severe belong to the later periods, the less severe to the earlier periods of the local disease, so that

it is thus possible to have at the same time in one organ the more severe (tertiary) form of the disease, and in another the less severe (the secondary). These last include what we have just spoken of as simply irritative inflammatory or hyperplastic formations. Under the former, the more severe types, the author includes the gummy tumours, which are almost heteroplastic. Nor do they belong exclusively to any given period of the disease; the original indurated chancre is in itself a gummy ulcer and not unfrequently proceeds from a gummy nodule. The author does not think that mercurial treatment has any special agency in developing gummy tumours.

The gummy tumours were first recognized upon the surface of the bones. For a long time they were confounded with nodes and exostoses. Subsequently, they were considered as an exudation between the periosteum and the bone. Closer study has shown, however, that instead of an exudation they consist of soft, rapidly developing tissue, not lying between the periosteum and the bone, but developed from the inner layer of the periosteum and resembling the mucous tissue. This tissue is made up of a delicate, viscid, intercellular substance, sometimes more or less fibrous, with cells sometimes caudate, sometimes round, smaller or larger, generally pale, having one, seldom two or more, pale nuclei. They do not always have this apparently fluid consistency, for they may be elastic and movable, and yet they are quite firm and hard; in this case the intercellular substance is more fibrous and the cells are star shaped with one or more nuclei, or caudate or round, in great abundance, but yet of low development. The next step may be suppuration, but this is rarely the case. Their decay follows very shortly, for the gummy tumours have generally but a short existence. If they have a longer existence, it is not so much due to the persistence of the elements as to the proximate infection. They are generally subjected to the fatty metamorphosis, and if the intercellular substance has been quite firm and fibrinous, they present a cheesy appearance quite similar to tuberculous matter. This is not the beginning of a process, it is no crude material, no exudation derived from the blood, but, on the contrary, dead tissue, which may remain *in loco* a longer or shorter time.

The further course of these tumours is as follows: they may be absorbed and there may be left a slight flattening or even an actual depression in place of the previous tumour, and this is especially the case if the tumour has extended beyond the periosteum and involved the superficial layers of bone; these portions of bone are then involved in the fatty degeneration, and, when absorbed, there is an actual loss of substance. Sometimes, however, as is often seen in the os frontis, this depression is made still more apparent by a coexisting hyperplasia or thickening of the bone in the immediate vicinity. Again, the gummy tumours, especially when developed in the inner organs, may remain as a permanent nodule, and this is more apt to be the case when there has been a callous-like thickening of the neighbouring tissue. And finally, they may terminate in ulceration.

We see, therefore, that the pre-existing local condition is that of action and irritation, and the gummy tumour is regarded as the specific product of syphilis not so much because its microscopic elements are specific in their nature, for the same elements may be found in atheroma of the arteries for instance, but because it is found in organs which are the precise points of election for syphilis and in which nothing similar occurs, and, according to the author's opinion, its existence is due to the most complete action of the specific virus.

We hasten to pass in review the other organs in which the gummy tumours are found. The author, as has been stated, considers the indurated chancre as only another manifestation of the same formation, proceeding often from a gummy nodule, and resulting in a gummy ulcer. The fully-developed gummy tumour is found in the skin in a nodular form, either singly, or in groups or masses which consist of a multitude of individual nodules. The seat of the nodule is in the cutis itself. These soon become ulcerated, the ulcers being deep and coated with a thin foul secretion. Left to themselves, they still continue to extend; by proper treatment, especially by local treatment with sublimate, they rapidly heal, leaving small white scars with a strong tendency to retraction. These scars may again become the seat of new formations, and

these have been designated cheloid. The third variety of gummy tumours found in the skin and mucous membrane is the condyloma. These formations belong to the earlier stages of the disease, and correspond to the second period; they have a broad base or are pointed; the former is an actual product of the skin, while the latter contains an excessive amount of hypertrophied epidermis. These also tend to ulceration, and yield readily to treatment. They are found chiefly in spots where the epidermis is tender, or where it passes into the mucous membrane, or on the mucous membrane itself, especially in the pharynx. These affections of the skin and mucous membrane are often complicated with affections of the lymphatic glands—buboes—and these may undergo an amyloid degeneration.

The gummy tumours of the internal organs—the so-called visceral syphilis—undergo more frequently the cheesy metamorphosis. The liver has long been known as the most frequent seat of such deposits, and in it we can pursue our study to the best advantage. Generally upon the surface of the liver, beneath a thickened portion of the albuginea, frequently beneath an adhesion between the liver and diaphragm, we find a star-shaped depression; from this point a callous tissue extends into the substance of the organ, and imbedded in this lie the nodules, in uneven, round, or long masses. Sometimes only one such spot is found; generally there are several, connected together by broad fibrinous bands, and thus forming lobular retractions and divisions of the surface. They are generally upon the superior surface of the liver, especially beside the suspensory ligament, and from this point they may extend so far into the substance of the organ as to reach the portal vein, and thus produce a complete division between the right and left lobes. Others belong more to the interior of the organ, and often have their origin in Glisson's capsule. Whether upon the surface or in the interior, the nodules are generally enveloped in a thick capsule of connective tissue, of a whitish stringy character. The microscopic examination reveals but little regular structure; the whole substance seems made up of a more or less fibrous mass, richly laden with fat-globules. The author, in one of his earlier works, has shown that this is not the only type of syphilis affecting the liver. He has there shown that there are three distinct varieties, viz., perihepatitis, simple interstitial hepatitis, and gummy hepatitis, the first of which is almost always united with one of the other two. The same process as has here been described may be observed in other organs, as, *e. g.*, in sarcocele syphilitica. We must pass over the other developments of syphilis in the muscles, the heart, the lungs, the membranes of the brain, and the brain itself, for we trespass upon our space, and we have already given enough to show the author's mode of investigation, and a general view of his opinions.

We cannot avoid, however, giving the reader some of the remarks with which he concludes this portion of the subject. He divides the local syphilitic processes into three groups—the simply irritative (inflammatory, hyperplastic), the gummy, and the amyloid; the first two belong actually to syphilis, the last to the syphilitic cachexia. Neither of the first two has added anything foreign to the natural elements of the body—anything in the sense of specific or heterologous, anything peculiar alone to syphilis. Every year, with all its abundance of new material for observation, confirms the author in the opinion that there is no more marked difference between the gummy tumour, with its mass of syphilitic granulations, and a simple inflammatory granulation, than there is between roseola syphilitica and simple roseola. All admit that the same virus is within the body infectious, without contagious. The whole course of syphilis has much in common with that of malignant tumours. It begins, as a rule, with the indurated chancre; this induration corresponds to the mother nodule of the malignant tumour. It may extend in depth and superficially. Then the lymph-glands in the direction of the lymph-current are affected. Then the disease appears in remote points, at first in lighter, simply irritative forms, afterwards in the more severe, and at last in the gummy formations. In these last the induration of the mother nodule is repeated with the modifications imposed upon it by the nature of the local matrix. This is what in all other relations would be designated as metastasis. Whether this occurs through the blood and the lymph, or through cells, is not yet clearly determined. This much is certain, that sooner or later there is an

infection of the blood—a dyscrasia is found to exist. Nor is this a permanent state. The idea of latency is to be explained by a metastasis already existing at the period when the original affection was healed, and which only after a certain period makes itself manifest. And so with regard to the tertiary products; if we give up the idea of a permanent dyscrasia, we must either admit a general diathesis of the whole body, a permanent syphilitic condition of all its elements, or else a still existing nidus, a deposit of virus in some given spot; and it is this view that the author does not hesitate to adopt. Thus, after the healing of a chancre and of the symptomatic buboes, a syphilitic hepatitis may continue to exist, without at first developing any symptoms; but upon some casual provocation it may be again excited, may attain increased development, and may become in turn infectious. By infection and the development of a new local nidus the process is made manifest. These views find their application in the history of congenital syphilis; but, tempting as is the theme, we must pass on to the consideration of other subjects, commending these pages of our author, upon syphilis, to the careful perusal of the reader.

The second form of granulation tumour is lupus, though the term tumour hardly seems applicable to it; but it is a conglomeration of individual nodules, and hence it is to be considered among tumours. It is a process which affects the whole thickness of the cutis; a granulation process in the connective tissue, beginning at first superficially and extending deeper and deeper, passing into the subcutaneous tissue, and in many cases even reaching the bone. Frequently extending upon the mucous membrane, creeping into the nose, upon the lips, and the hard palate, it presents small uneven bunches, which do not proceed from the epithelium, but from the connective tissue. Everywhere the formation of lupus consists of newly-developed granulation tissue, very soft, and often very vascular, containing, as a rule, small round cells with simple nuclei and one or two nucleoli surrounded by a delicate intercellular substance. Ulceration is the most common sequel to these formations; superficial crusts are formed, the substance beneath goes on decaying, the tissues are destroyed, and an ulcer steadily increasing in depth ensues, thus giving us the type of lupus exedens. More rarely, even before ulceration has taken place, the process becomes stationary; the cells yield probably to a fatty metamorphosis, and are subject to absorption, while the remaining tissue becomes thickened and retracted, thus leaving white cicatrices, with loss of substance and superficial depression, like the syphilitic gummy tumours upon the surface of bones. This corresponds to lupus non exedens. Again, we may have this thickening and retraction at one point, while at another, generally on the periphery, ulceration may be going on, stretching further and further. This is the lupus serpiginosus of Hebra. The disease exists as the result of a certain predisposition, but whether as the result of a scrofulous or any determined dyscrasia, whether from greater vulnerability of the skin or from local tendencies, the author will not pretend to decide. The only safe and sure mode of treatment is local. The author recommends the use of kali causticum, and has only seen a recurrence where the caustic has not been applied to all the diseased spots.¹

We pass over the third division—elephantiasis—because it possesses for us less practical value, inasmuch as the disease is so rare with us. The author treats the subject with his usual fulness of detail and clearness of outline, and it is a valuable contribution to our knowledge of this disease.

The twenty first lecture is upon lymphatic tumours. The author first divides these into the hyperplastic, *i.e.*, pre-existing lymphatic tissue abnormally developed; and heteroplastic, *i.e.*, formations of lymphatic elements where none previously existed. He then proceeds to explain the origin and define the limits

¹ We have seen numerous cases treated at Hebra's clinic. He uses the pencil of nitrate of silver, the actual cautery, and the galvano-caustic, sometimes giving the patient his choice of the three. They generally prefer the actual cautery, asserting that the pain, though more severe, is also more transient. When the nitrate of silver is used, he insists that it should be in no superficial manner, and any one who has seen him apply it, must have been convinced that it was done most thoroughly.

of the terms scrofula, struma, and tubercle. After setting apart the *strumas*, as affecting special glandular structures, for another lecture, he proceeds to the lymphatic tumours, including therein all those formations which are generally supposed to result from a lymphatic dyscrasia. The products of leucæmia afford occasion for a continuation of the discussion of the question of priority between our distinguished author and Prof. Bennett, of Edinburgh. These products are hyperplastic in the glands in which they are found—the lymph-glands and the spleen, for instance—but they develop, as if by local infection, heteroplastic formations in parts where no lymph elements normally exist. The author's views upon leucæmia and leucocytosis are doubtless familiar to most of our readers, through his work on *Cellular Pathology*. The pathological manifestations of typhoid fever, as in the glands of Peyer and in the solitary follicles of the rectum, are then cursorily treated, as occupying a place midway between leucæmia and scrofulosis. The latter is then considered, and we shrink from conducting our readers into the much-disputed territory of scrofula and tubercle. Discussions which have waxed and waned for generations are appalling, and we bide the time when these perplexing questions shall be more definitely settled. At some future day we shall hope to follow the author through the third and closing volume.

E. T. C.

ART. XXV.—*Fecundity, Fertility, Sterility, and Allied Topics*. By J. MATTHEWS DUNCAN, A. M., M. D., etc. 8vo. pp. 378. Edinburgh: A. & C. Black, 1866.

Researches in Obstetrics. By the same Author. 8vo. pp. 467. New York: Wm. Wood & Co., 1868.

THE work on Fecundity, Fertility, etc., by Dr. Duncan, of Edinburgh, is a most valuable and interesting one. So far as the researches of the author go in regard to the conditions of 16,953 legitimate births registered in Edinburgh and Glasgow, Scotland, the conclusions he has drawn from them appear to be fully sustained. But for their establishment, as positive physiological truths, it is necessary that their agreement should be tested with similar inquiries instituted in respect to the reproductive function in women among different peoples inhabiting different climates and different sections of country.

We believe that our best plan, as well to evince our high estimate of the value of Dr. D.'s labours in elucidation of the several important questions discussed by him, as to instruct our readers in respect to the conclusions to which his researches have led him, would be to present simply his general conclusions on each question discussed, and pretty much in his own words. We had concluded to pursue this course, but in proceeding to carry it out we found it would occupy more space than could with propriety be spared for its proper accomplishment, we have been obliged, in consequence, to confine it to the first four of the ten parts into which the volume before us is divided.

In the first part are discussed the variations in the fecundity and fertility of women according to age.

a. The actual fertility of the female population as a whole at different ages.

From the data examined by Dr. D. in elucidation of this inquiry, he concludes that, 1. The actual, not the relative, fertility of the Scotch female population chiefly made use of in the inquiry, as a whole, at different ages, increases from the commencement of the child-bearing period of life, until the age of thirty is reached, and then declines until its extinction together with the child-bearing faculty. 2. The actual fertility is much greater before the climax, thirty years, is reached, than after it is passed. 3. At least three-fifths of the population are recruited from women not exceeding thirty years of age.

b. The comparative fertility of the female population at different ages. In respect to this question, the conclusions of Dr. D. are:—

1. It increases gradually from the commencement of the child-bearing period of life until about the age of thirty years is reached, and then it still more

gradually declines. 2. It is greater in the decade of years following the climax—about thirty years of age—than in the decade of years preceding the climax.

c. The comparative fecundity of the whole wives in the population at different ages. From the data adduced the conclusions are: 1. The fecundity of the mass of wives in our population is greatest at the commencement of the child-bearing period of life, and after that period gradually *diminishes*. 2. The fecundity of the whole wives in our population included within the child-bearing period of life is, before thirty years of age is reached, more than twice as great as it is after that period.

d. The initial fecundity of women at different ages. On this point the conclusions of Dr. D. are as follows: 1. The initial fecundity of women gradually waxes to a climax, and then gradually wanes. 2. Initial fecundity is very high, from twenty to thirty years of age. 3. The climax of initial fecundity is probably about the age of twenty-five years.

e. As to the fecundity of women at different ages, the conclusions are: 1. Nearly all women married between twenty and twenty-five years of age are fecund. 2. The fecundity of very young wives (from fifteen to twenty years) is greater below twenty than that of such as married at from twenty-five to twenty-nine. 3. There is a climax of fecundity in women, which is reached between the ages of twenty and twenty-five years.

Dr. D.'s *second inquiry* is as to "the weight and length of the new-born child." His conclusions are drawn from the examination of 2070 pregnancies, with 2087 children, which occurred at the Edinburgh Royal Maternity Hospital. a. The influence of primogeniture on the weight of the newly-born child. *Conclusions* 1. The weight of children of primiparæ is far from being uniform; it varies according to the age of the mother. 2. The weight of the children of all mothers, whether primiparæ or multiparæ, varies also according to law of the mother's age. 3. By a table given of the mean weights of the children of first and subsequent pregnancies it is shown that no increase or decrease occurs according to the number of the pregnancy, after the first, the children of which are no doubt, as a rule, the lightest. b. The variation of the weight of new-born children according to the age of the mothers. By a table given it is shown that the weight of the child gradually increases to its climax with the age of the mother, from twenty-five to twenty-nine years. After this age the weight of the child very slowly declines. This slowness is entirely out of proportion with the rapid diminution of fecundity of women of similar ages. c. The influence of primogeniture on the length of the newly-born children. The same general conclusions in respect to the weight of children of primiparæ and multiparæ may be repeated in respect to the length of newly-born infants. d. In regard to the variation in the length of the newly-born child according to the age of the mother, Dr. D. remarks, that a careful study of the weights and lengths of newly-born mature children lends some support to the doctrine that the vigour of the female reproductive system waxes to the age of about twenty-five years and from that period wanes.

The *third part* of Dr. D.'s treatise presents some remarks on the production of twins.

a. The number of twins born of women of different ages. According to Dr. D. the mean age of 16,301 mothers of legitimate children in Edinburgh and Glasgow, in 1855, was above twenty-nine years. The mean age of 198 wives bearing twins was thirty-one years. The twin bearer is thus older than the general run of bearers. In the same population the number of twins born by women under thirty years of age was 86; the number born by women above thirty years was 112; showing a majority of 26 on the side of the elder women. Or, while of all births among these 16,301 wives three-fifths occurred among women under thirty years of age, there occurred only two-fifths of the twins among these younger women.

b. Influence of age on woman's fertility in twins. From somewhat imperfect data it is inferred that when woman generally is most fecund she is least likely to produce twins. Between the ages of twenty and thirty years fewest wives have twins. Before and after that period of high general fecundity the special productiveness in twins increases.

c. Initial fertility in twins at different ages. By a comparison between two sets of fertile women, the one bearing single children, the other bearing twins, the law as to the increase of twins as fertile women grow older is deduced. A regular increase is shown to take place until the age of forty years is reached. Every 153d woman among the youngest fertile women bears twins within two years after marriage; among the older women, from thirty-five to forty years of age, every 42d woman bears twins within two years after marriage, or nearly four times as many.

d. Relation of the frequency of twins to the number of the mother's pregnancy. From the statistics examined by him Dr. D. concludes that: 1. The actual number of twins born in different pregnancies decreases as the number of the pregnancy increases. 2. The comparative number of twins born in different pregnancies increases as the number of the pregnancy increases. 3. The increase of the comparative number of twins with the number of the pregnancy does not appear to hold good with the first pregnancy as compared with the three immediately subsequent pregnancies; women in their first pregnancies being more likely to bear twins than in those immediately subsequent.

e. In respect to the size of families in which twins occur, Dr. D. presents a table which shows that the average size of families of women married the same number of years is greater in the twin bearing than in ordinary families, counting down to the birth of the twins.

The following is a *résumé* of the conclusions which the author has attempted to demonstrate in reference to the question of twins:—

"1. The largest number of twins is produced by women of from twenty-five to twenty-nine years of age, and on each side of this climax of fertility in twins there is a gradually increasing falling off in the number as age diminishes on the one side and increases on the other.

"2. Twins are not regularly distributed among births generally, their production, therefore, is not subjected to the same laws which govern ordinary fertility.

"3. The mean age of twin-bearing mothers is greater than that of mothers generally.

"4. Twins increase in frequency as mothers become older. This forms a striking contrast to the fecundity of a mass of wives (not mothers), which diminishes as their age increases. It accords, however, with the law of intensity of fertility of fertile women.

"5. Newly-married women are more likely to have twins the older they are.

"6. While the fecundity of the average individual increases with age till twenty-five is reached, and then gradually diminishes, there is some probability that the opposite is true, so far as regards twins alone; fertility in twins being greatest when fecundity is least, and *vice versa*.

"7. The actual number of twins born of a mass of women in different pregnancies decreases as the number of the pregnancy increases.

"8. The number of twins relatively to the number of children born in different pregnancies increases with the number of the pregnancy. In other words, a woman is more likely to have twins in each succeeding pregnancy than in the former pregnancy. The first pregnancy forms an exception to this rule.

"9. In an individual, twin bearing is a sign of high fertility at the time. It also in a mass of women shows a high amount of fertility, at least till the time of the birth of the twins.

"10. It is probable, though not proved, that twin-bearing women have larger families than women uniformly uniparous."

The subject of the fourth part of the treatise under consideration is the laws of the fertility of women. a. Of the fertility of the whole marriages in a population. From somewhat imperfect data Dr. D. draws the following conclusion, of value only in proportion to the value of the data upon which it is based; namely, the average duration of fertility in married women, including those who do not bear children, is about seven and a half years. b. Of the fertility of the whole fertile marriages in a population at a given time. c. On the annual fertility of the married women of child-bearing age. d. On the size of the families in a population at a given time. e. On the fertility of the whole of the marriages in a population that are fertile at a given time. f. On the fertility of fertile

marriages lasting during the whole child-bearing period of life. *g.* On the fertility of persistently fertile marriages lasting during the same period. *h.* On the fertility of persistently fertile wives at different years of married life. *i.* On the fertility of fertile wives at different periods of married life. *j.* On the degrees of fertility of wives, mothers of families of different numbers.

Although much of interest will be met with in the chapters devoted to the consideration of the first nine of the questions just mentioned, yet no general conclusions have been attempted by Dr. D. in respect to either, in consequence of the inefficiency and fewness of the data he was enabled to collect for their elucidation.

In respect to the 10th question stated above, Dr. D. gives as the first conclusions deducible from the data given by him : 1. The mass of early or first children, up to the third or fourth, come into the world in more quick succession than those that immediately follow ; 2. A mass of children, numbering from the fourth or fifth on to the tenth, succeed one another more slowly than those of the first category, and of the third ; 3. A mass of children, following the tenth, come into the world hurrying after one another with a gradually increasing rapidity, which excels that of all their predecessors ; a circumstance which may, in part at least, account for the great mortality of women bearing children after the ninth.

It seems to Dr. D. that the first of these three conclusions can be explained only by supposing what may therefore be held as equally well demonstrated: 1. That wives bearing their early children, up to the third or fourth, breed more rapidly than they subsequently do ; 2. That wives produce their children, numbering from the third or fourth on to the tenth, at greater intervals than their earlier progeny ; 3. That wives bearing more than ten children, or wives bearing very large families, breed more rapidly than others during their whole childbearing lives.

There are several other interesting questions bearing upon the general theme of the laws of the fertility of women, which we shall pass over without notice.

We regret that the space to which we are necessarily limited will oblige us to close with only a single quotation from one of the six remaining parts which complete the volume before us. Like the first four parts, the subjects discussed in the latter are of deep importance, not merely in their bearing upon obstetrical science, but also to that department of political economy which treats of population and to the principles of life insurance. To appreciate fully the value of Dr. D.'s labours in the elucidation of the several topics discussed by him demands a careful study of the work itself.

The quotation with which we shall close the present notice is from that portion of the work which treats of the duration of pregnancy. They are the general conclusions of the author on the subject.

"1. The interval between conception and parturition (the real duration of pregnancy) has not been exactly ascertained in any case ; 2. The average interval between insemination and parturition (commonly called the duration of pregnancy) is 275 days ; 3. The average interval between the end of menstruation and parturition is 278 days ; 4. The intervals between insemination and parturition and between menstruation and parturition have no standard length, but vary within certain limits ; 5. While absolute proof of the prolongation of real pregnancy beyond its usual limits is still deficient, yet there is evidence to establish the probability that it may be protracted beyond such limits to the extent of three or four weeks, or even longer."

The essays composing Dr. Duncan's volume of *Researches*, the title of which is given at the head of this article, we are told by the author in his preface, are chiefly selected from his contributions to various medical and scientific periodicals, all, however, carefully revised, while to many of them have been made large and important additions. A few of the essays make their first appearance in the volume before us. The entire series are deeply interesting—most of them are of great practical value. The first part comprises five chapters or essays appertaining to questions relating to "the statics" of pregnancy—as, the position of the uterus ; the natural position of the fœtus in utero in advanced preg-

nancy; position of pregnant females; mode of presentation of dead children in labour.

The *second* part contains also five chapters, in which the female pelvis is studied in an obstetrical point of view. The *third* part is divided into nine chapters. In these are discussed questions relating to the physiology and pathology of pregnancy and the puerperal state, as menstruation in the early period of pregnancy; superfoetation, site of insertion of ovum; internal surface of uterus after delivery; the lochia; length of cervix uteri in advanced pregnancy, etc. etc. The several subjects of which this portion of the volume treats are of no inconsiderable interest; they are all discussed by the author in a manner calculated to convey to the reader clear and we think correct views in respect to them.

The succeeding, or *fourth* part of the work contains eight chapters on questions relating to natural and morbid parturitions, as the dynamics of labour; the power exerted in ordinary and difficult labour; the power of the uterus to resist a bursting pressure; obliquity or lateral flexion; production of inverted uterus; cases of injury to bones and joints in parturition.

The *fifth* part is divided into three chapters devoted to subjects of a miscellaneous character, namely, the retentive power of the abdomen; certain points in "uterine metrology;" cases of vagina duplex, and simple uterus, and of sacculated uterus.

The subjects embraced in the researches of Dr. D. are illustrated by some forty wood-cuts.

The entire volume is full of instruction; and the practitioner will be amply compensated for the time spent in its careful study. D. F. C.

ART. XXVI.—*Stone in the Bladder; with Special Reference to its Prevention, early Symptoms, and Treatment by Lithotrity.* By WALTER J. COULSON, F.R.C.S., etc. 8vo. pp. xviii., 124. London: John Churchill & Sons, 1868.

WE are not informed as to the relationship of the author of this volume to Mr. William Coulson, well known as the writer of a treatise on the diseases of the bladder and prostate gland. That work has maintained its high reputation for many years in its successive editions, and from that fact and from the writer's name, we were prepared to form a high estimate of Mr. Walter J. Coulson's essay now before us. We must confess that we have been disappointed. The volume in question contains a good deal that is of interest, and a good deal that is important, but its information is neither so novel, nor so definite and precise, as we had hoped to find it.

The first portion of Mr. Coulson's book consists of three lectures delivered at St. Peter's Hospital for Stone, etc., during the summer of 1867. The latter part treats of the chemical constitution of the different varieties of urinary calculus, and gives some directions as to the prophylactic measures which may be adopted to prevent calculous formation.

The first lecture considers the early symptoms of stone, and the best method of detecting calculus.

The fact is dwelt upon that as a rule the early symptoms of stone are more acute among children than among adults, and hence in the latter class, the presence of a vesical calculus is often not detected until it has attained considerable size. For the early diagnosis of stone, the influence of exercise is the best indication. Hæmaturia is a not unfrequent symptom of stone, and if it depends upon the presence of a calculus will be most marked after taking exercise. And so with the other symptoms that depend upon the action of the stone as a foreign body in the bladder.

The existence of stone being rendered probable by a consideration of the various circumstances of the patient's case, it becomes the duty of the surgeon to explore the bladder by mechanical means. For children, Mr. Coulson thinks

the sound known as Sir Wm. Fergusson's, which has a narrow shaft and a bulbous beak, superior to any other instrument. For adults he recommends the employment of a lithotrite instead of a sound. The lithotrite Mr. Coulson thinks gives no more and sometimes even less pain than the sound, and with it the surgeon is less apt to miss the calculus than with the ordinary instrument. The lithotrite besides, he thinks, enables the surgeon to gain information as to the size and condition of the bladder which he otherwise could not obtain. Now, while we are perfectly ready to believe that Mr. Coulson, or any other gentleman who has had large experience in the use of the lithotrite, can make use of it as a means of exploration, with advantage, we cannot but believe that in the hands of most practitioners it would prove a less innocuous instrument than a simple sound: and as in practice almost every physician, especially among those that live in the country, will have occasion to sound for stone, while the operators both by lithotomy and lithotripsy will of necessity be comparatively very few, we must regard the advice given in the lecture under consideration as unsound, unless it is to be considered as limited to the few who are to become practical lithotritists.

Moreover, we suspect the relative superiority of the lithotrite as an exploring instrument is exaggerated. The same delicacy of touch and operative tact that are required for a satisfactory examination with the lithotrite will, we think, enable the surgeon to derive very important information from the use of the sound alone. And the argument in favour of the lithotrite, that its use enables the surgeon to proceed at once to crush the calculus, loses weight when it is remembered that nearly one-half of the cases of stone in adults are confessed, by even ardent lithotritists, to be unfit for their favourite operation; and that it is generally impossible to say of any case, before sounding, whether it will or will not require cutting rather than crushing.

Lecture Second is devoted to "the preparatory treatment of patients, and the operation of lithotripsy." The advice given under these heads we have found reasonable and judicious. It is not usually desirable to inject the bladder before proceeding to an examination or operation with the lithotrite, as in the first place but a small quantity—three or four ounces—of fluid in the bladder is required, and that can be best secured by directing the patient to retain his water for an hour or two before the surgeon's visit, and in the second place the very process of injection produces a certain amount of irritation which is of itself undesirable.

Rest in bed is to be enforced for a few hours both before and after the operation. Stricture of the urethra, if it exist, should be relieved before any treatment is directed to the calculus itself. Hyperæsthesia of the urethra may be overcome by the repeated use of bougies, or this complication may be sometimes advantageously met by the administration of an anæsthetic. In cases of cystitis, chloroform has been found especially useful. The existence of organic renal disease does not contraindicate lithotripsy; but renders it necessary to proceed very cautiously and gently, and to be satisfied with accomplishing but a little at each sitting.

Mr. Coulson compares what is called the French method with the ordinary English method of performing lithotripsy, and states his preference for the former. In this the lithotrite is gently made to explore each part of the bladder, and to seize the stone in whatever part it may happen to be, while in the English operation the blades of the lithotrite are widely opened in the middle of the bladder, and then by depressing the beak, the stone is made to fall by gravity between the jaws of the instrument.

We think Mr. Coulson, in the following paragraph, underrates the skill and labour required to make a successful operator in general surgery, and gives an undue prominence to that which he considers needful in his own special branch of practice. Speaking of study upon the cadaver, he says: "In this respect, there is no operation in surgery that requires such special education as lithotripsy. As to most other operations, except those practised on the eye, a knowledge of anatomy combined with attendance in the operating theatre, will enable the surgeon to perform them; but it is not so with lithotripsy. To acquire proficiency in this, it must be learnt on the dead subject, and practised on the living. Its every stage requires learning and mastering, etc." (p. 31.) Now,

we must say that this language, used in a public lecture and then printed in its present shape, seems to us better adapted to magnify the importance of St. Peter's Hospital for Stone and the skill of its surgical staff, than to give students and the public just ideas upon the subjects brought under discussion.

Take for example operations on the larger arteries; we think that our readers will agree with us that "to attain proficiency" in the performance of these operations, they likewise "must be learnt on the dead subject, and practised on the living:" no mere theoretical "knowledge of anatomy combined with attendance in the operating theatre will enable the surgeon to perform them" with confidence and safety; but they, as well as lithotripsy, in their "every stage require learning and mastering," and without such learning and mastering should not be attempted.

Lecture Third professes to describe cases where lithotripsy is not applicable; the amount of work to be done at each operation; and the after-treatment, with a notice of such complications as may arise. This portion of Mr. Coulson's volume seems to us especially open to the charge of incompleteness and indefiniteness. We are told in general terms that lithotripsy is not applicable to large calculi; but no hint is afforded as to where the line is to be drawn. Is the weight of a calculus unfit for crushing, to be estimated by grains or by ounces? Should the diameter of a stone adapted for lithotripsy be measured by inches or by lines?

Of course it is impossible to fix an exact limit, but this is the point of all others upon which the young lithotritist will feel at a loss. He knows that if the urethra be preternaturally narrow or excessively sensitive, lithotripsy is so far contraindicated; and that, on the other hand, if his patient present evidence of organic disease of the kidney, he must beware of resorting to lithotomy; but if the viscera be healthy and the urethra of full calibre and not irritable, and the stone of what may perhaps be called a "medium-size," how is he to determine which operation to adopt? Surely a work on lithotripsy, emanating from St. Peter's Hospital for Stone, should throw some light upon this question.

With regard to the amount of work to be accomplished in each operation, Mr. Coulson thinks that the first should not last longer than two minutes. In this time it is usually possible to crush the stone two or three times. As to the proper interval between the first and second operations, he says: "The following is the practice my experience has dictated in this matter. If the pain and other symptoms have begun distinctly to diminish before the usual time for the next sitting, I wait until the fourth day for their further subsidence. If they continue, and especially if there are rigors, and much pain of a cutting character, the cause is almost certainly irritation by angular fragments, and I am inclined rather to anticipate by a day or two the usual period." In some cases, several crushings may be required; "where, however, the early symptoms of calculus have not been disregarded, two operations should suffice."

Mr. Coulson is "in the habit of adopting after each operation the recommendation of Sir Benjamin Brodie, namely, that of giving the patient a glass of hot negus or brandy and water." This he believes to mitigate if it does not prevent the rigors which sometimes follow the operation. The custom of injecting the bladder after lithotripsy with the view of washing away fragments, is reprobated, except in special cases. Where there is an atonic condition of the bladder, it may be done in order to prevent irritation from the decomposition of urine. In case a fragment becomes impacted in the urethra near the neck of the bladder, Mr. Coulson thinks it better to push it back into that viscus than to attempt to extract it. If it should be necessary to remove a fragment from the anterior part of the urethra by external incision, the edges of the wound should be nicely adjusted with sutures, as otherwise a fistulous opening will inevitably result.

Retention of urine following lithotripsy may best be treated by keeping an elastic catheter in the bladder for fourteen or twenty hours, keeping it open by the injection of a little warm water from time to time. If the calculus be supposed to be principally of the uric acid variety, advantage will be derived from the administration of the citrate of potassa, in drachm doses, three or four times a day. If the calculus is phosphatic and the urine ammoniacal, injections

of dilute nitric acid (f3j—Oj) may prove of service. Under no circumstances should an attempt be made to bring away fragments in the lithotrite or scoop. After lithotrity, the bladder or the testes may become inflamed. Should the kidneys become involved, the complication, if overlooked, is very apt to prove fatal.

The three lectures, which we have been considering, occupy sixty pages—nearly one half of the book. The remaining portion, which is headed "Prevention," is principally occupied with an account of the chemical and microscopic characteristics of the various forms of calculus. A few pages are devoted to a consideration of the attempts which have been made to bring about solution of calculous aggregations. We find nothing new under this head, the only case referred to being that reported by Dr. Charles Petit, in illustration of the effects of Vichy water. [See Dr. Roberts' paper on "Solvent Treatment of Calculi," in *Med.-Chir. Trans.*, vol. xlviii. 1865, page 111]. In this case the patient, after drinking almost incredible amounts of the water in question, passed *per urethram* "a smooth uric-acid concretion, which bore evident traces of dissolution." The difficulty about cases such as this, is that similar occurrences are occasionally met with by every surgeon, where no solvent treatment has been adopted.

Mr. Coulson's account of the chemistry of urinary calculi is sufficiently satisfactory, though we do not perceive that he has thrown any new light upon the subject. The same may be said with regard to his remarks upon the preventive treatment to be adopted. The principles to be applied are as follows:—

"1. To diminish the amount of the abnormal constituents in the urine, or to remove, so to speak, the diathesis.

"2. To prevent the calculous material from being precipitated.

"3. To keep the urine in a dilute state, by abundant drink, and to flush the urinary system from time to time."

The particular methods to be employed to meet these indications, in the case of each variety of calculus, are described; and the author concludes, as he began, by recommending the use of the lithotrite as soon as it is believed that a concretion has actually lodged in the bladder.

We have thus endeavoured to give a fair analysis of Mr. Coulson's work, and while we have striven to avoid being hypercritical, have thought it but right to indicate those points in which we have found it inaccurate or deficient. And it must be remembered that Mr. Coulson's production challenges a more rigid examination than most other publications: when a surgeon to a special hospital undertakes to instruct the profession at large upon the subject of his specialty, we are entitled to expect something more noteworthy than what we might be satisfied with from an ordinary general practitioner. And from this point of view we must think Mr. Coulson's essay a failure.

Should the sale of Mr. Coulson's work be sufficient (as we hope it may) to call for a second edition, we trust that he will make it indeed a complete treatise upon the science and art of lithotrity. We are sure, from reading his book, that he is already a lithotritist of great skill and experience, and with the opportunities that he must possess at St. Peter's Hospital, we doubt not that he will soon have, if he have not already, the materials for a monograph which would immediately be recognized as authoritative.

One other word of advice, which we would respectfully offer to Mr. Coulson, is not to undervalue, even by implication, those who, unlike himself, do not lay claim to peculiar skill in the treatment of any special class of affections. We have no dislike to specialists, as such; we recognize that some branches of medical science demand by themselves a life-long study. The language of Sir William Fergusson (himself a most eminent lithotritist) in his recently published lectures before the Royal College of Surgeons of England, we would adopt as our own:—

"Ophthalmic Surgery has made wonderful strides within our own time; but I do not profess myself competent to dwell on such a theme. It is pleasing to see that those who excel in this department, particularly amongst ourselves, are gentlemen who, from their education and competency, are fitted to hold the highest places in general surgery, and that many of them have held, and now hold, the foremost rank in our profession. Let me here express a hope that

some future professor in this chair may be able to say as much for all who may devote themselves to the specialities of modern custom."

This desirable consummation, we may add, is not to be forwarded by ignoring the merits of those who do not so devote themselves.

"Nam qui . . . aut se ostentat, aut eorum, quibuscum est, vel dignitatis, vel commodi rationem non habet, . . . is *ineptus* dicitur."—CIC., *de Orat.*, lib. ii. cap. iv. J. A., JR.

ART. XXVII.—*The Diseases of the Prostate; their Pathology and Treatment; comprising the Jacksonian Prize Essay for the year 1860.* By Sir HENRY THOMPSON, F.R.C.S., etc. Third edition. 8vo. pp. xxiv. 364. London: John Churchill & Sons, 1868.

THE first edition of this now classical work appeared under the title of "The Enlarged Prostate," and was made the subject of an able analytical and critical notice in the number of this Journal for April, 1858. In the spring of the year 1861, Sir Henry, then Mr. Thompson, was awarded the Jacksonian prize for an essay on "The Healthy and Morbid Anatomy of the Prostate Gland." The incorporation of this essay in a revision of his original work, constituted the second edition of the latter, published under the same general title as the volume now before us, and was noticed in the number of this Journal for January, 1862.

In the present, third, edition, the author says: "I have added many hints relating to the treatment of prostatic disease in its various forms which increased experience has taught me; at the same time, by removing matter which was out of date, or which has appeared to me unnecessary, the bulk of the volume has not been increased."

The work before us consists of two parts, the first embracing two chapters, treating of the anatomy of the prostate, and the second, of seventeen chapters, discussing at length the diseases of the prostate. Thirteen well-executed plates are added, illustrating different portions of the text.

A book so well and so favourably known as this of Sir Henry Thompson's, it would be equally superfluous to commend or to criticize. Suffice it to say, that the deserved reputation which was acquired by the previous editions, is well sustained by that now offered to the public. The author's views upon the different subjects embraced in the pages before us are well known, and are acknowledged to be well-founded. Extended original investigation, wide reading, and mature reflection and reasoning, have combined to render Sir Henry Thompson's published opinions authoritative upon the subjects of which he treats.

Where the matter of a volume is so excellent, it is to be regretted that the manner of its production is not equally to be commended. Though the book is printed with the usual elegance which characterizes the productions of the Messrs. Churchill, it is not free from misprints which occasionally tend to hinder a clear understanding of the author's meaning. Thus, on page 132, the word *casual* is used instead of *causal*, conveying of course a very different signification from that intended. Again, on page 224, discussing the treatment of hypertrophied prostate by compression, the author is made to say, "I am of opinion that the risk encountered of irritating the parts does not compensate for any little benefit obtained;" the meaning obviously being that the benefit does not compensate for the risk.

On page 230, the word "*present*" is used as a neuter or intransitive verb—"the varied difficulties which may present," instead of "which may present themselves," or "which may be presented." Another point, for which we fear the author must be held responsible rather than the printer, is a reference in a foot-note at page 353, to "*Val. Basil*," in which disguised form we think we recognize our old friend Basil Valentine, the accredited discoverer of metallic antimony.

These are but trifling errors it is true, but the book would be none the worse if they were corrected. Sir Henry Thompson's work is already, as we have said, classical; and it is but just to add, generally written with elegance and precision. For this very reason its occasional slight defects are the more observable.

In taking leave of the third edition of Sir Henry Thompson's work we cannot express our appreciation of it better than by quoting the final sentence of the notice of its second edition, published in the number of this Journal for January, 1862 (page 206) :—

"In its present state the work is by far the best with which we are acquainted, in any language, on the important subjects of which it treats; and we take sincere pleasure in calling to it the attention of the profession."

J. A., JR.

ART. XXVIII.—*Lectures on the Theory and Practice of the Ophthalmoscope.*

By HENRY WILSON, F.R.C.S., M.R.I.A., Licentiate of the King and Queen's Coll. of Phys. in Ireland, Assist. Surg. to St. Mark's Ophthalmic Hospital, etc. 8vo. pp. 148. Dublin: Fannin & Co., 41 Grafton St. London: Longman & Co., 1868.

THE value of the ophthalmoscope in ocular and cerebral affections is daily becoming more generally acknowledged, and the time is not distant when that instrument will be considered as imperatively necessary for the diagnosis of those diseases, as the stethoscope is for that of pulmonary and cardiac affections. The great work of Zander is too learned and elaborate for most physicians, and a moderately sized book which furnishes a clear and concise description of the instrument, how it is to be used, and what is to be observed with it, by one who is himself experienced in its employment, was really wanted, and this want the author of the volume before us has well supplied; it is what he designed it to be, a very clear and useful "introductory guide to the study of the diseases within the eyeball."

The volume comprises twelve lectures. The first is devoted to an account of the theory and principles of the ophthalmoscope; focal illumination; Cumming's and Helmholtz's discoveries; reversed and erect images.

In the second is given a description of the construction and of the several forms of the ophthalmoscope. The author prefers Liebreich's hand ophthalmoscope as the simplest, most convenient, and most practical of all instruments, in which we agree with him, but prefer one of larger diameter than that which he figures.

The third lecture is devoted to the consideration of the parts seen by the ophthalmoscope—the fundus and the vitreous humour.

The fourth lecture contains an account of the mode of examining the eye with the ophthalmoscope, also of the means of illumination and a description of the normal appearance of the fundus.

In lecture five we are furnished with an excellent account of the anomalies of refraction and accommodation which have of late years attracted so much attention, also of myopia, hypermetropia, presbyopia, and astigmatism.

The sixth lecture is devoted to a description of the vitreous humour in health, and to an account of its diseases. Under the latter will be found interesting descriptions of hyalitis, opacities of the vitreous humour, effusions of blood into it, synchysis, synchysis scintillans, foreign bodies and entozoa in it, tumours extending into it, and its atrophic degeneration. The account of *muscæ volitantes*, an affection of such frequent occurrence, and which often gives nervous patients great uneasiness, is excellent, and as its nature and significance are not so generally understood as they ought to be, we are induced to transfer this description to our pages.

"The abnormal appearances most frequently met with in the vitreous are the so-called *muscæ volitantes*; these appear to the affected individual of the most diverse shapes and varied sizes; small, circular black dots, plain or with a nebu-

lous halo round them or light in the centre; or tailed black objects like a comma (,) ; these spots may be single or numerous, and may have a certain determinate motion up and down or may revolve round each other, the *muscæ* may also be in the shape of a gauze-like film or mist, plain or spotted; of elongated lines or streaks, or beaded threads; or a dark irregular mass of greater or less magnitude; they may have a fixed position, but usually they move about, either in a certain definite traject or irregularly; as a rule they are only seen when the lids are open, and when looking at a white surface, at the sky or at light; sometimes they can only be seen in certain positions of the eye and when sought for; in other instances they occur in all positions and movements of the eye. A very common complaint is that of a small black spot floating in the peripheral portions of the field of vision; the affected individual, thinking, on the first appearance of the spot, that it is a particle of dust floating in the air, or a fly (hence the name *myodesopsia* from *μύα*, a fly, and *ὄψις*, vision; *visus muscarum*), puts up his hand to brush it away, but finding it still persistent after various such attempts, becomes often not a little alarmed. When we are consulted about these phenomena we should always dilate the pupil fully and make a very careful examination of the lens and the interior of the eye before pronouncing an opinion respecting them. When the parts in front of the vitreous are transparent, we are able in a great number of cases to see these *muscæ*; the ophthalmoscope mirror being used alone and the affected eye made to move quickly in different directions, the dark object is seen to float into the bright illumined field, and then to disappear slowly or rapidly; it may even remain stationary for a time, and then sink down. These floating bodies generally arise from the sides or bottom of the vitreous chamber in the movements of the eye, and appear by their direct examination with transmitted light as more or less dark opaque objects very often corresponding to the patient's description of them; by incident light with oblique illumination they appear often of their natural grayish colour. Sometimes extensive masses of membranous opacities float about in the humour almost constantly, which would mechanically interfere considerably with vision, were there even no disease in the other structures; indeed I have seen persons who during the temporary and occasional subsidence of such floating bodies could see pretty distinctly, and who would become almost blind the next minute from these objects ascending and intercepting the rays, and causing symptoms not unlike those of detached retina. The fundus may be normal and wholly visible, or these bodies may prevent its being distinctly or entirely seen; or it may be, as is frequently the case, diseased. These floating bodies consist of broken-down hyaloid membrane, or proliferation membranes, or fibrinous remains of blood clots, or effusion products from the choroid and ciliary tract. Simple floating spots are a very common precursor of cataract, or accompaniment of that disease in its early stage; when the cataract has fully formed they disappear, because they are invisible against the dark opaque lens; when the lens is removed and light once more admitted they frequently again become visible; they also arise from congestion, from overwork or straining of the eye. I have known them arise in persons, possibly predisposed to them, who worked much at the microscope, the ophthalmoscope, or the telescope; the large floating masses are often exudation membranes, due to choroiditis; they have frequently a thick black border, and diminish gradually into a thin semi-transparent cobweb-like membrane. *Muscæ volitantes* are often attributable gastric derangements, but as they are merely temporary and passing, and are not due to any defect in the vitreous humour, we should be slow in attributing *muscæ* to disorders of the stomach, as is so frequently done; we are too prone indeed to ignorantly father on the stomach, symptoms, which owe their origin to morbid processes in some other organ. *Muscæ* occur at all periods of life, and may often remain unaltered, without any further complication, or without any impairment of vision beyond the temporary and mechanical one. To nervous and timid persons they are a source of great annoyance and mental anxiety; the defect is always present, not only to their mind's eye, but literally to their bodily eye; they are constantly thinking of it, and incessantly looking for it and regarding it. I have known such persons go from one practitioner to

another seeking for a cure, and finally fall into the hands of nostrum-mongers and quacks."

The optic nerve, its congenital peculiarities and diseases, the acuity and field of vision, are the subjects of the seventh lecture.

In lectures eight and nine the author treats with ability of the retina and its congenital peculiarities and diseases.

Lectures ten and eleven are devoted to the consideration of the choroid, its congenital peculiarities and diseases, myopia, panophthalmitis and sympathetic ophthalmia.

The twelfth and last lecture furnishes a very good account of glaucoma, formerly, that great puzzle to ophthalmic surgeons, but few agreeing even what was meant by the term. The ophthalmoscope has thrown a flood of light upon this disease, and enables us now to refer it to a definite pathological condition.

We commend this work to practitioners who have not the time or disposition to study the scientific and elaborate work of Zander, and who yet may desire more information than they can get from the handy-book of Laurence and Moon, or from the general treatises on the diseases of the eye ordinarily accessible. It has supplied, we conceive, a desideratum in our medical literature.

ART. XXIX.—*Electro-Physiology and Therapeutics; being a Study of the Electrical and other Physical Phenomena of the Muscular and other Systems during Health and Disease, including the Phenomena of the Electrical Fishes.* By CHARLES E. MORGAN, A. B., M. D. 8vo. pp. xvi., 714. New York: Wm. Wood & Co., 1868.

THIS large volume is a posthumous publication. "The death of the author," says Dr. Hammond, under whose supervision it is brought out, "soon after the completion of his work, and before it went to press, has prevented him giving it that careful revision which almost all abstruse treatises require previous to their publication." We regret that Dr. Hammond has confined his connection with the book to a mere correction of the proof-sheets, for we cannot but think that it would have been advantageous for all parties had that careful supervision, which the author was unhappily prevented from bestowing, been in a measure at least supplied by the editor.

The work, though very voluminous, is to a certain extent fragmentary, for the discussion of the therapeutical application of electricity, or, as the author terms it, "electrotherapy," occupies but a very small portion of the whole.

There is unquestionably an immense amount of information embodied in these pages, and the writer, we doubt not, was thoroughly conversant with all the ramifications of his subject; yet his style is so obscure and involved, and the facts which he announces are presented in such a confused and unattractive manner, that while his readers will be few, those that read understandingly and with profit to themselves will be still fewer.

The melancholy event which removed the author from this world before the appearance of his learned treatise, of course places that treatise beyond the reach of such criticism as would legitimately deal with the work of a living writer. Hence, when we have announced the publication of this volume and indicated its general scope and tendency, our pen is arrested and we can go no further.

We may mention among the chapters which we have found most interesting, the twentieth, which treats of the effect of dying on the muscular current, of rigor mortis and its causes, and the effects respectively of heat, cold, narcotic poisons, and corrosive liquids.

As we have said before, there is a great deal in this book, and a great deal that is very valuable; the peculiarities of the author's style are accounted for by Dr. Hammond, by the fact of Dr. Morgan's long residence in Germany.

We cannot commend the publishers for the manner in which they have per-

formed their part ; the want of uniformity in the colour of the paper on which the volume is printed is very unsightly.

In spite of Dr. Hammond's care, we have noted a considerable number of misprints, and the wood-cuts, except in their occasional complicated obscurity, have not struck us as being worthy of the text they are meant to illustrate.

J. A., JR.

ART. XXX.—*Inhalation ; its Therapeutics and Practice. A Treatise on the Inhalation of Gases, Vapours, Nebulized Fluids, and Powders, including a Description of the Apparatus Employed, and a Record of Numerous Experiments, Physiological and Pathological ; with Cases.* By J. SOLIS COHEN, M.D. Illustrated. pp. 305. Philadelphia : Lindsay & Blakiston, 1867.

THIS book is well printed and of convenient size. We recognize in it the work of a persevering physician who has faithfully studied his subject, and added to its literature much that is useful from his own experience. While preparing a report to the American Medical Association on the Therapeutics of Inhalation, he accumulated a quantity of material much too voluminous for that purpose, and therefore determined to incorporate the most valuable portions in book-form. It is divided into three parts, treating respectively of the inhalation of nebulized fluids ; of medicated airs, gases, and vapours ; and of powders.

The author has entered extensively into details in all sections of the subject, particularly in the historical record of experiments upon men and animals, physiological and pathological, as to the penetration of spray into the respiratory passages. These details are carefully grouped, and are interesting for reference ; but the value of the work as a guide to practice would have been rendered more direct and positive by condensation, and by the conspicuous summary of principles and rules which have been gradually eliminated, and for which a considerable degree of certainty may now justly be claimed.

The cases furnished from Dr. Cohen's own note-books are corroborative, in the main, of the general conclusions heretofore deduced from observations made in various directions. They tend to confirm our belief that in the inhalation of atomized fluids we have gained a therapeutic means of great importance in the treatment of respiratory maladies, and which possesses also a range of application far beyond the production of local effects for which it was originally intended.

The use of medicated airs, gases, and vapours, although long familiar to the profession and frequently investigated, is more fully considered in Part II. of Dr. Cohen's treatise than in any other equally accessible work. The scattered literature of the subject has been diligently collected and faithfully classified ; the reader being presented with the accumulated facts under well arranged heads, so that he can easily form his own estimate of their value. In regard to the employment of "lime inhalations" in diphtheria and croup, according to the plan of Dr. Geiger, who poured hot water upon unslaked lime, and caused the steam arising from it to be breathed, we are inclined to believe that but little lime could reach the affected parts, and that the benefit was really derived from the steam alone. This is rendered more probable from the fact that subsequent observations have failed to establish the view, originally advanced by Biermer and Küchenmeister, that hot lime-water, applied by means of an atomizer, will speedily dissolve false membrane.

In Part III. Dr. Cohen has given us briefly and clearly whatever is valuable in relation to the insufflation of powders in respiratory affections, with the experimental proofs and pathological evidence of their penetration into the bronchial tubes and lung tissue. We think the subsequent pages justify the statement in the preface that "the writer has endeavoured to present the whole subject as impartially as a decided bias in favour of inhalation would permit.

E. R.

ART. XXXI.—*Observations on the Nature and Treatment of Polypus of the Ear.* By EDWARD H. CLARKE, M. D., Prof. of Mat. Med. in Harvard University, &c. 8vo. pp. 71. Boston: Ticknor & Fields, 1867.

THIS interesting and instructive "brief memoir," as it is called by its accomplished author, is an important result of the more general and intelligent attention paid to an always troublesome but long-neglected class of disorders. It is based upon observations made some years ago and laid aside, under the pressure of other professional engagements, only to be called forth in their present form by "the interest which diseases of the ear have recently excited."

We welcome such an essay, not only as coming from an acknowledged expert, but as materially tending to arouse and encourage the very interest referred to as the cause of the present publication.

Although his work is not offered "as a complete account of polypus of the ear, but simply as a contribution to the study of it," Professor Clarke has succeeded in presenting a better view of the subject than any we have met with, and one which certainly goes further in exhibiting the anatomical structure and microscopical characters of these growths. He begins with a short introductory notice of the unsatisfactory and somewhat conflicting views of the different leading authorities in regard to the nature, causes, and treatment of non-malignant growths within the auditory meatus, and then enters at once into the clinical investigation with the record of thirteen very minutely and carefully reported cases, which are selected as illustrations of the varieties of plastic growth in question.

The ample details of these clinical reports are followed by a thorough analysis and a tabular exhibition of the cases, which greatly facilitate the practical study of the subject; and which, in connection with the reports themselves and the accompanying microscopical drawings, afford an unusually precise and comprehensive picture of the peculiar disorder which they are intended to portray.

They may not tell the well-informed reader and observer many things which are actually new, but they undoubtedly throw a great deal of much needed light—considerably more than the author is so modestly content to hope for—upon the pathology and treatment of an ailment, which he well describes as not less obstinate and disagreeable in itself than it is injurious to the ear and hearing.

The second part of the essay is occupied with a description of non-malignant aural polypi and of their treatment, which is founded on the experience acquired since the observations recorded in the first part as well as on that afforded by those cases. In this chapter he gives us a concise but clear and full account of the structure, course, characteristics, and treatment of the two varieties or classes—into which he divides these growths—fibro-plastic and epithelial. Among several matters of interest we would invite attention especially to his remarks in regard to the external and internal appearances; the mode of examination; the use of his modification of Wilde's snare, of Toynbee's forceps, and of caustic and astringent applications; injection into the substance of the tumour; cauterization and other treatment after extraction; the employment of the douche as a substitute for the syringe; the liability to a return of the polypus, and the general ease of removal and probability of permanent cure.

For these and many other important particulars we must direct our readers to the work itself, earnestly recommending it as containing a greater amount of desirable information upon its subject than has hitherto appeared in this country; and as affording this in a neat and otherwise attractive form, which renders it still more worthy of an honourable place among the waymarks of genuine professional advancement.

E. H.

ART. XXXII.—*A Manual of the Dissection of the Human Body.* By LUTHER HOLDEN, F. R. C. S., Ass. Surg. of, and Lecturer at, St. Bartholomew's Hospital, London. With Notes and Additions by ERSKINE MASON, M. D., Demonstrator of Anat. in Coll. Phys. and Surgs., New York. With numerous Wood Engravings. 8vo. pp. 588. New York: Robert M. De Witt, 1868.

It is so often the custom for the medical matriculate to enter at once upon the labours of the dissecting-room that the anatomical demonstrator, in the majority of instances, may be said to become his first teacher. No one, not excepting his own preceptors, comes in such intimate contact with the student as he; and to his anatomical knowledge, experience, and skill in teaching, the progress of the pupil is to a great degree due. The importance of the position cannot be over-estimated; and in no department of our lamentably defective method of instruction is there more room for improvement. Apart from the many deficiencies which will suggest themselves to the minds of all, the need of proper guides in dissection has, perhaps, until recently, been as pronounced as any. It is true that many books of the kind have been published; but none, we conceive, entirely adapted to the purpose. Without an exception imperfectly illustrated, their descriptions are either redundant, on the one hand, or meagre on the other. It appears to have been the design of Mr. Holden, though nowhere directly expressed, to furnish the student with a *real* dissector, one presenting the outlines of anatomy through the personality of the teacher. This connection, evident upon the first paragraph of the admirable volume before us, is impressed upon it throughout. We can almost imagine, while glancing over its pages, that we are listening to the voice of the author as he stands with his class about the subject engaged in demonstrating its various regions. The style is easy, the descriptions are fresh—brief for general features, fuller where practical bearings are announced—and continually display the tact of an experienced anatomist; the illustrations stand to the text as so many boldly sketched diagrams, and the well-told surgical points come in here and there to give zest to the discourse. In evidence of these remarks we can particularly refer the reader to the account of the cervical, pharyngeal, axillary, and femoral fasciæ; to the hand and knee-joint, or to the male perineum and nervous system.

It is, perhaps, with the two last-mentioned descriptions that the best qualities of the book are seen. The one for the skill with which this difficult region is described, and for the directness of its illustration; the other for the laudable attempt to free this branch of anatomy of its absurd nomenclature. Though we cannot but regret that the artificial plan now in vogue of dissecting the brain from above downward, had not been altogether discarded for the more rational one of continuing the demonstration of the spinal cord upward unto the encephalon. In no other way can its relations be understood.

The labours of Dr. Mason consist chiefly in making such additions, "both as regards the anomalies of the vessels and muscles, as the student should be familiarized with while pursuing his studies, together with the measurement and weight of organs, and occasional reference made to some operation which it is well for him to practise upon the cadaver." They have also extended to include the narrative of well-known cases of importance in surgical practice in this country; for Mr. Holden has not been free from that almost universal fault of English authors, both in and out of the profession, of ignoring or underrating the claims of American contributions to science; and we regret to find that Dr. Mason has not been sufficiently careful of the claims of his own countrymen, since he has allowed, without a protest, the credit of being the first to divide the palatine muscles in the operation for staphyloraphy, which is undoubtedly due to the late Dr. J. Mason Warren, of Boston, to be awarded to Sir Wm. Fergusson.

H. A.

ART. XXXIII.—*Chronic Diseases of the Larynx, with special reference to Laryngoscopic Diagnosis and Local Therapeutics.* By Dr. ADELBERT TOBOLD, Lecturer in the University of Berlin. Translated from the German and edited by GEORGE M. BEARD, M. D., Lecturer on Nervous Diseases in University of New York. With an Introduction on the History and Art of Laryngoscopy and Rhinoscopy, Rhinitis, Inhalations, and Electrization, applied to Diseases of the Air-passages, and an Appendix by the Editor. With forty-four engravings on wood. 8vo. pp. 279. New York: Wm. Wood & Co., 1868.

SUCH is the lengthy title-page of this really good book, one too which offers a comprehensive and yet not too elaborate view of the chronic diseases of the larynx. We are glad to find that the treatises upon the manual of laryngoscopy are followed by such works as Gibb's, Türck's valuable Klinik, and the one now before us. It indicates progress in the right direction. It presupposes that the profession, as a whole, have at last recognized the importance of the new field of observation so recently laid open to them, that they have as it were familiarized themselves with the technical procedures of laryngoscopy, and now demand clinical instruction from those best able to give it, in order to establish themselves in their diagnosis, to advance them in their therapeutics. To meet such a demand is the object of Tobold's work.

The editor has added to this an introduction and an appendix, together covering ninety pages, in which he has grafted on to the original the story with which we have already become familiar. The history of laryngoscopy, the description of the instruments used in the examination, and the mode of conducting an examination, do not add much to our previous stock of knowledge. We must in justice, however, state that, in the editor's language, he has endeavoured "to make the work in its totality a practical, and so far as possible an exhaustive compound of the best experience of the profession on the subjects of which it treats," etc. We think it would have been in better taste to have omitted from the body of the work the advertisement of the editor's joint work upon the Medical Use of Electricity. As a translator Dr. Beard has accomplished his task with credit, and, with a few exceptions, has made attractive and "readable English." Sometimes the meaning is not as clear as we could wish for, as on page 215 we read: "The carcinomata cause only a peculiar feeling of pain, and would be particularly characterized by attacks of a lancinating pain at night, if other symptoms were present at the same time, which absolutely establish the fact of the presence of a tumour."

The chapter in the translator's introduction upon rhinitis is of much interest. The treatment with the posterior nasal syringe is preferred to any other method, and solutions of the chlorate or the permanganate of potash, of tar-water, or of glycerine, with small amounts of tannin, iodine, or alum, are recommended, and lastly, in case these fail, or as an adjuvant, general, partial, or local electrization. In the chapter upon the latter mode of treatment as applied to diseases of the air-passages generally, the editor disapproves of the local method of applying electricity upon two grounds: 1st. Its operation is not as thorough nor are its effects as permanent. 2d. "Localized electrization, especially when either pole is applied directly to the mucous membrane, is a procedure at once painful and disagreeable."

The translator's introduction is followed by the author's, of which the heading runs: "On the possibility, under all circumstances, of making an exact diagnosis." We must confess to a feeling of self-reproach and a questioning of our own powers, as we read this introduction, until we came to the closing sentence, viz.: "Absolute impossibility of examination can exist only in young children," etc. We are well aware of the great advantages that may be gained in difficult cases by constant drilling, but we are still hardly prepared to agree with the author, even allowing the exception that he makes. The most consummate tact, and the most unwearying patience will at times, we think, find insurmountable obstacles to a successful laryngoscopic examination.

The author then proceeds, after a section upon the histology and physiology of the larynx, to the classification of the chronic diseases of the laryngeal mucous membrane and the subjacent tissue as follows: 1st. Simple chronic laryngitis, or laryngeal catarrh; 2d, chronic ulcerative laryngitis; 3d, tubercular laryngitis, or laryngeal phthisis. Each is treated in detail as to its anatomico-pathological appearances, its symptoms and course, its etiology, laryngoscopic diagnosis, prognosis, and general and local treatment. We have thus, as is evident, a complete compend of these diseases from all points of view. In the first-named disease the author advocates the treatment with much stronger solutions of nitrate of silver than we have been accustomed to use, or than have been recommended hitherto, if we remember rightly. He proposes a solution of argent nit. $\mathfrak{Hj}$ — $\mathfrak{Zij}$, and even more to $\text{aq. } \mathfrak{Zj}$. He prefers a sponge to a camel's hair pencil, and attaches it to a wire rather than to a whalebone. We are glad that he refers to the utter uselessness of gargles in all such cases. It is surprising to see how universally gargles are prescribed, when in fact they can only reach the parts anterior to the uvula and the pillars of the soft palate. We consider gargles, except in affections of these parts and the tonsils, rather as a *placebo* than otherwise.

The syphilitic diseases of the larynx, œdema, and abscess, the diseases of the perichondrium, spasmodic diseases, and paralysis of the muscles, are all delineated with the same faithfulness and discrimination. In the electrical treatment of paralysis the author, as well as Dr. Beard, prefers the partial application to the local, as recommended by Mackenzie. In the treatment of foreign bodies in the air-passages the author recommends tracheotomy so soon as there is any danger of suffocation; and even where the body is lodged in the bronchial tubes, or where emetics, or Brodie's method of bending forward the head and striking upon the back, are to be used, he advises tracheotomy as a prophylactic. He thinks that there is danger of the foreign body becoming impacted in the glottis in the expulsive efforts. Of course there is this possibility, but we are not prepared to say that we would recommend so extended an application of this operation.

The closing section is upon neoplasms of the larynx, the diagnosis and treatment of which constitute the crowning glory of laryngoscopy as an art. The various forms of tumours with their laryngoscopic appearances, are delineated with accuracy and care. We wish that this portion of the work could have been made more valuable by the introduction of a few well-executed and characteristic wood-cuts, and perhaps by the addition of a few illustrative clinical records. The neoplasms are comprised under polypi, papillary, carcinomatous, cystic, and fatty tumours. The diagnosis of these tumours may be within reach of a comparatively unskilful laryngoscopist, but their removal should be attempted by the most dexterous operators alone. The author wisely recommends, to the more inexperienced, practice upon the *phantom*. He suggests a very useful model by the attachment of a skull to an iron standard introduced into the occipital foramen. A fresh larynx and trachea with the tongue, or a prepared specimen, is then to be placed *in situ* and attached by pins to the standard. We thus have the best model upon which to practise the various necessary manipulations. In general the author prefers, in operating, cutting instruments to those that crush and tear. We are glad to find that he spares us the addition of new instruments to the already extensive armamentarium of the laryngoscopist.

We have thus briefly sketched the scope of the work before us. We welcome it as a valuable addition to our library, and one which we think will easily find its way into the hands of the medical public; for the specialist *per se*, however, the more extended works of Türck and Gibb will perhaps present greater attractions.

E. T. C.

ART. XXXIV.—*Vierteljahrschrift für die Praktische Heilkunde, Herausgegeben von der Medicinischen Facultät in Prag. Redaction: Dr. JOSEF HALLA, O. O. Professor der 2 Med. Klinik. Fünfundzwanzigster Jahrgang, 1868. Erster und zweiter Bands, oder Siebenundneunzigster und Achtundneunzigster Band der Ganzen Folge. 8vo. pp. 318-286.*

Quarterly Journal of Practical Medicine. Published by the Medical Faculty of Prague, under the editorship of Dr. JOSEPH HALLA, Professor of Clinical Medicine. Twenty-fifth year of publication, 1868, First and Second Vols.

THROUGH the politeness of the editor of this well-known and very able journal we have been supplied with the issues for the first two quarters of the present year. We hope to receive the future volumes early after their publication in Prague, and shall be pleased to lay before our readers an abstract of such of their contents as shall seem to be most interesting and valuable.

Each volume is divided into four parts: 1st. Original Communications; 2d. A Summary of Contributions to the several branches of Medicine, chiefly those contained in the leading professional journals of Continental Europe. The articles in the summary are arranged under the heads of 1. General Physiology and Pathology; 2. Pharmacologia; 3. Balneology; 4. Physiology and Pathology of the Blood; 5. Physiology and Pathology of the Circulatory Organs; 6. Physiology and Pathology of the Respiratory Organs; 7. Of the Digestive Organs; 8. Of the Urinary Organs and of the Male Reproductive Organs; 9. Of the Sexual Organs of the Female (Gynæcologia and Obstetrics); 10. Of the Integuments; 11. Of the Organs of Locomotion; 12. Ophthalmologia; 13. Diseases of the Ear; 14. Physiology and Pathology of the Nervous System; 15. Psychiatria; 16. Medical Jurisprudence. Each of the departments of the summary is under the charge of a separate editor. The entire summary is very full and satisfactory.

The *third* part of each volume is devoted to literary notices. The *fourth* is a miscellaneous department, giving the movements of universities and scientific bodies generally; appointments, removals, and deaths of physicians, etc.

The first of the volumes before us contains three original articles: 1. Annual Report of the Royal Bohemian Foundling Hospital for 1866; by Dr. G. Ritter. 2d. An Epidemiological and Clinical Study of the Epidemic Cholera which prevailed in Prague during the year 1866; by Drs. A. Pribram and J. Robitschek. Both these papers are very elaborate productions, and replete with interest. The third original paper is on luxations and fractures of different bones and their treatment; by Dr. Schinzinger. It is interspersed with many interesting cases.

The second volume for 1868 of the Prague Journal contains *five* original articles. The first is a History of the Artificial Eye and of the Projection Sphere; by Prof. Hasner. The second, by Dr. Shütz, is on the Nature of the Impermeability of the Intestines. The third treats of the Mechanism of the Movements of Artificial Feet, and a description of an artificial limb to supply the loss of an entire lower extremity, or of the leg only; by Dr. Hermann. After looking over this communication we have come to the conclusion that our American artists, in the construction of artificial limbs, greatly excel their Bohemian contemporaries; taking into consideration the neatness, beauty of form, and the variety, facility, extent, and firmness of the movements of the artificial substitutes. The fourth paper is on the retention of the testicle at the groin, and the relief of the patient by a surgical operation; by Prof. Szymanowski, of Kiew. The fifth paper, on diseases of the uterus—polypi, and fibroid tumours—is by Dr. Säxinger, after the demonstrations and observations of Prof. Seifert, made at his Gynæcologist clinic.

D. F. C.

ART. XXXV.—*The Treatment of Diseases of the Throat and Lungs by Inhalations, with a New Inhaling Apparatus.* By EMIL SIEGLE, M. D. Translated from the second German edition by S. Nickles, M. D. pp. 136. Cincinnati: R. W. Carroll & Co., 1868.

THE author in his preface gives us reason to hope for a volume containing the well-digested results of his observation and experience, widely extended since this was written. In the mean time, we are pleased to have this little book presented in a form accessible to the profession. The name of Siegle is well known in connection with the "steam atomizer," various modifications of which possess in an eminent degree the qualities necessary for the production of an efficient and easily applied spray. The advantages particularly and justly claimed for this apparatus are "the steady stream, the possibility of working it without fatigue and without an assistant, the small quantity of medicated fluid required, the minute division of the fluid, and its warmth." He insists strenuously upon the necessity of the thermo-barometer in order to regulate accurately the strength and temperature of the current. But this has been found practically entirely possible without it. In carrying out his investigations the author wisely "confined himself to a few remedies," being persuaded that if the new therapeutical measure is to meet with that success which may justly be expected from it, observers must at first examine these few thoroughly, as to their doses and their physiological and therapeutical effects. "Simples alone should be used for inhalations. Corrigents and adjuvants ought to be banished, at least for the present, until the effects of each single remedy in different cases have been fully recognized." Thus preserving his experience from the dangers of excessive division, he has arrived at certain rules of administration and conclusions concerning treatment, which are briefly but distinctly presented. The special points set forth need not be here enumerated. Many of them have passed, with due recognition, into the pages of those American physicians whose labours, diligently pursued and carefully recorded, have enriched the literature of the subject. To those who wish to peruse them in the more expanded form in which they were first offered, we cordially recommend this translation.

E. R.

ART. XXXVI.—*Atlas of Venereal Diseases.* By A. CULLERIER, Surgeon to the Hôpital du Midi, Member of the Surgical Society of Paris, etc. etc. Translated from the French, with notes and additions. By Freeman J. Bumstead, M. D., Prof. Venereal Diseases in the Coll. of Phys. and Surg., New York, etc., with about a hundred and fifty beautifully coloured figures on twenty-six plates. Parts II. and III. Philadelphia: Henry C. Lea, 1868.

WE have before us the second and third parts of this most valuable and splendidly illustrated work.

The subjects treated of in these parts are some complications of blennorrhagia, as bl. arthritis, balano-posthitis; blennorrhagia in women including vulvitis, folliculitis, vaginitis, metritis, ovaritis, urethritis, vegetations, and soft and indurated chancres.

These numbers are issued in a style which fully justifies all the praise given in our previous notice (No. for April last, p. 520); indeed, some of the illustrations are perhaps even more beautifully executed than those in the first part.

We hope before our next number appears, to receive the work complete—when we shall fully point out its peculiar claims to the favourable consideration of the profession.

ART. XXXVII.—*Archives de Physiologie Normale et Pathologique*. Publiée par MM. BROWN-SÉQUARD, CHARCOT, VULPIAN. Nos. 1, 2, 3. Paris: Victor Masson et Fils, 1867.

THIS valuable journal should receive the support of every scientific physician. The three numbers before us contain highly valuable contributions to our science from some of the most learned and industrious investigators of our day; among these we may enumerate MM. Brown-Séguard, Charcot, Vulpian, Prevost Lannelongue, Liegeois, Felix Guyon, Cornil, Hayem, Chossat, Laborde, Parrot, Leven, etc.

It is very handsomely printed, and elegantly illustrated; the numbers before us contain eleven plates, two of which are coloured.

We shall enrich our quarterly summary from time to time with notices of the more practical articles which are contained in this useful journal.

ART. XXXVIII.—*Dictionnaire Annuel des Progrès des Sciences et Institutions Médicales suite et Complément de tous les Dictionnaires*. Par M. P. GARNIER, Méd. de l'asile de Bon-Secours, Rédacteur de l'Union Médicale, etc. Précédé d'une Introduction par M. le Docteur AMÉDÉE LATOUR. Quatrième Année, 1867. Paris: Germer Baillière, 1868.

THIS is a most useful publication. It is very much on the plan of *Ranking's Abstract* and *Braithwaite's Retrospect*, except that the subjects are arranged alphabetically. The present volume is the fourth of the series, and presents a very clear and full summary of the progress made in all the departments of medicine during the preceding year. We have read it with profit, and made use of it in making up our own summary, and hope to still further enrich our pages on future occasions from the store of information it furnishes.

ART. XXXIX.—*On Diseases of the Skin; a System of Cutaneous Medicine*. By ERASMUS WILSON, F. R. S., Seventh American from the Sixth and Revised English edition. With twenty plates and illustrations on wood.

In noticing the issue of a new edition of this well-known and now classical work, it is sufficient to say that the author has carefully revised the whole, rewritten many parts of it, and bestowed particular attention to the practical application and improvements of treatment, while the American publisher has very appropriately added to the illustrations the plates prepared by Mr. Wilson for his work on "Constitutional Syphilis and Syphilitic Eruptions," these affections having been in the recent editions of this work treated of very particularly.

ART. XL.—*Photographs of Diseases of the Skin, taken from Life under the Supervision of* HOWARD F. DAMON, A. M., M. D., F. M. M. Soc., etc. 4to. Boston: James Campbell, 1867.

WE have space only to briefly call attention to this useful publication, which is designed to present accurate photographic illustrations of cutaneous diseases. The first series before us contains representations of chronic eczema, herpes zoster, impetigo, ecthyma, rupia, and R. (annular). These photographs furnish probably as accurate representations of those diseases as can be done without the aid of colours. The photographs of chronic eczema of the hand and of impetigo of the face are particularly good.

We shall notice the work more fully when the whole series shall, as we hope they will be, completed.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *Minute Structure of the Kidney.*—The following are the chief results of the investigations of M. RENDOWSKY on this subject: 1. The uriniferous tubules either terminate in blind extremities, or are continued into the capsules of the Malpighian bodies. 2. The Malpighian capsules are set, for the most part, on convoluted tubules lined by nucleated epithelium; these tubuli finally communicate with other and smaller canals, which are supplied with transparent epithelium. 3. Some capsules are connected with straight tubuli, which, at some distance from the capsules, take on the characters of the convoluted tubuli. 4. The tubuli, lined by transparent (non-nucleated) epithelium connect the convoluted and the straight tubes, of which the former are in communication with the capsules, and the latter open into the pelvis of the kidney. 5. The canals, with transparent epithelium, described by Henle as continuations of the tubuli uriniferi, are really bloodvessels.—*Brit. Med. Journ.*, May 23, 1868, from *Virchow's Archiv*, bd. 41, 1867.

2. *Influence of Diet upon the Mother's Milk.*—The contradictory opinions that are entertained in respect to the influence of diet upon the quantity and quality of the milk induced Dr. SUBOTIN, of Petersburg (*Virchow's Arch.*, vol. xxxvi. p. 561), to institute a series of experiments to settle, as far as possible, the question. His investigations led him to the following conclusions: 1. That animal food increases the daily yield of milk, while a diet of vegetables diminishes it. Food of a fatty nature caused a marked diminution of the milk, and even, when persisted in, its entire suppression. 2. The character of the food had an evident influence upon the relative proportions of the several elements which enter into the composition of the milk. By an animal diet the amount of the solid matters was increased, and this increase was especially shown in an augmentation of fatty material. The increase of casein was less evident. The augmentation of these two substances in the milk was not merely relative but absolute; the daily amount of milk secreted being increased by animal food. The proportion of its albuminous and saline ingredients underwent scarcely any appreciable change. Under the use of an animal diet there was not detected any large reduction of the saccharine matter of the milk, as Beusch supposed to occur. Neither was the opinion confirmed by the experiments of Drs. Beusch, Playfair, and others that the fatty constituents of the milk are augmented by a vegetable, and diminished by an animal diet. By a change from an animal to a vegetable diet the quantity of the solid ingredients of the milk, namely, the fat and casein, was diminished, while the saccharine matter was somewhat increased. By fatty food the solid ingredients of the milk were but relatively increased especially the butyraceous, while at the same time there was a decrease in the sugar. 3.

The fact developed by the experiments of Dr. S., namely, that by animal food the quantity of butter in the milk is so much increased, would seem to prove that the fatty matter of the milk is formed, in a great measure at least, from the albumen.—*Vierteljahrsschrift, f. d. Prakt. Heilk.*, No. xxv., 1868. D. F. C.

3. *Congenital Monorchia in Man.*—Dr. GRUBER, of St. Petersburg, in searching the literature of the last three hundred years, has found but twenty-two genuine cases of congenital deficiency of one testicle (monorchia). From a careful consideration of the details of these cases, and also one observed by himself, he is enabled to assert that the subjects of this congenital deficiency are generally well-developed, free from other malformation and structural defects, and capable of arriving at an advanced age. The scrotum is usually well-developed, and the testicle is more frequently absent on the right side than on the left. The seminal apparatus and genital organs on the opposite side rarely present any associated anomalies. The vesicula seminalis corresponding to the affected side is generally normal in size and form, and still acts as a secreting gland. No spermatozoa, however, have been found in the fluid taken from the vesicula seminalis on the side of the monorchia, although these bodies are generally present in great numbers in that of the opposite gland. The subject of a congenital monorchia, so long as the opposite testicle is well-developed, is not incapable of procreating. In a case reported by Graaf, the man was the father of four children.—*Brit. Med. Journ.*, April 4, 1868, from *Medizinische Jahrbücher*, hf. i. 1868

[Monorchidia and cryptorchidia have been fully investigated by M. E. GODARD in his valuable monograph, for a notice of which our readers are referred to the number of this Journal for January, 1859, p. 205 *et seq.*]

MATERIA MEDICA, GENERAL THERAPEUTICS AND PHARMACY.

4. *Bromide of Potassium.*—The high estimation in which this salt is held and its employment in the neuroses, especially in epilepsy, has given great interest to the researches of M. LABORDE upon the physiological effects produced upon animals, particularly frogs. He has deduced two principal facts: The progressive diminution, followed by complete and persistent abolition of reflex movements; and the entire preservation of voluntary movements.

The experiments of MM. EULENBERG and GUTTMAN agree in proving its paralyzing action on the heart and all the central parts destined for the conduction of motion and sensation in the spinal cord and the brain. The parietic or paralytic state in animals, the cessation of voluntary and reflex movements, the arrest of respiration and of the pulsation of the lymphatics, and the absolute want of all reaction to a mechanical or chemical irritation of the skin are proofs of this.

It acts directly and primarily, then not upon the encephalon, but upon the spinal cord, the function of which of presiding over reflex actions it annuls (*Acad. des Sci.*, Juillet).

By another mode of experimenting upon frogs, rabbits, and birds, MM. MARTIN DAMOURETTE and PELVET invalidated the interpretation of the preceding experiments. With the object of elucidating the exact *modus operandi* of this remedy, they administered it in different ways, in physiological, therapeutical, and toxic doses; and by withdrawing from its action several portions of the animal, so that it could be ascertained by exciting one, whether the other responded and in what manner.

The following are their most important conclusions: 1. The effects of bromide of potassium are always *direct*, that is, due to contact with the tissues, whether at the region of application, or in the parts of the system to which it is carried by the circulation, or in the organs by which it is eliminated. 2. It has no

elective action : certain systems are, however, affected before others. Thus, the sensory nerves lose their properties before the motor, the latter are affected before the spinal cord, and the spinal cord before the muscles. 3. The heart's action is destroyed at a late stage, and its contractions are frequently the only evidence of the vitality of the animal. 4. The respirations are affected in a secondary manner only ; they cease at the time of death in birds and mammals, while their continuance in frogs is dependent on the rapidity of the other effects. 5. The minute bloodvessels contract immediately, in the region of injection, and later, throughout the organism, and this contraction is succeeded by dilatation. 6. In warm-blooded animals, the temperature falls very sensibly ; at first, in the region of injection, and then in every part of the body. This difference depends on the effect on the minute bloodvessels, which is at first a local, and then a general one. 7. The secretions of the glands are diminished in proportion to the contraction of their bloodvessels. 8. The anaphrodisiac power of bromide of potassium is due to contraction of the minute afferent arteries of the *corpus cavernosus*. 9. It is not a poison of any special tissues or systems, it kills all, nerves and muscles ; and it may therefore be defined as a general nervo-muscular poison.—*Dictionnaire Annuel des progrès des Sciences et Instit. Médicales*. Par M. P. GARNIER, 1868 ; also *Journ. Anat. and Phys.*, May, 1868.

[Our readers will find some highly-interesting experiments, by Dr. BILL, on the mode of action of bromide of potassium in the original department of this No., p. 17.]

5. *Physiological Action and Therapeutical Uses of Conium*, by Dr. GEO. HARLEY. *Physiological Action*.—Hemlock acts as a depressor of the muscular movements, but the effect is influenced by the state of the muscles, whether they are in action or at rest. If a vigorous adult man take five or six fluidrachms of the succus conii, and then start on a long walk, in half or three-quarters of an hour he experiences a feeling of tiredness, especially in the knees and hamstrings. He may still continue to walk, feeling powerless, with some giddiness and feeling of heaviness over his eyes ; in an hour the sense of fatigue has gone off, and in another hour he is as active as ever. If five fluidrachms and a half be taken and he remain at rest, the eyes become first affected—the adjusting function is interfered with—then succeed drowsiness and dilatation of the pupils, then weakness of the legs ; he becomes cold, pale, and tottering ; the pulse is regular and of undiminished force and volume ; there is a diminution of muscular power in every part of the muscular system, and almost paralysis of the hamstrings and levator palpebræ. These symptoms are at their maximum about two hours after taking the dose, and have quite disappeared in three hours and a half. The succus was administered to several persons in doses of from three fluidrachms to one fluidounce with similar symptoms, but in doses short of three or four fluidrachms there is no appreciable symptom. The action is uniform and invariable in man and in all other animals. There is depression of the motor function of the third nerve, a lazy movement of the eyes, and sometimes strabismus, with imperfect adjustment of the refracting media of the eye. The effects are quite distinct from those of alcohol—the latter acts on the motor system only secondarily, and does not affect the action of conium. The full action of hemlock is a sleep ; it is to the corpora striata, the smaller nervous centres, and the whole of the motor tract, just what opium is to the brain—it tranquilizes and renovates the whole muscular system. At first it appears to paralyze this, but it is really a tonic, for Dr. Harley administered conium in full doses for months, and found the condition of the body was improved. The action of conium is influenced by the muscular activity more than by the muscular power. The sedentary with abundance of strength are more affected than the delicate but active. A delicate child will often take as much as would reduce some strong men to a tottering condition. Hence the dose of conium must be proportioned to the degree of motor activity of the individual, whether child or adult ; in fact, it might almost be said that by conium we may measure the bodily activity of the individual. Hemlock has no pure cerebral effects ; the irritability of the spinal cord is diminished ; there is no evidence of distinct interference with the sensory functions.

Mode of Action on the System.—In thirteen cases in which it was administered the secretion of urine was in no way altered. That fluid was searched most carefully and by different processes, but no trace of conia could be obtained; hence it is not eliminated by the kidneys, and could not be detected in the pulmonary or cutaneous exhalations. It has no direct action on the sympathetic, but nutrition is improved. Pain in cancer is diminished, probably from relaxation of muscular fibres, as the division of neighbouring muscular fibres relieves irritable ulcers. A dose of conium which falls far short of physiological effects is of no more use than a dose of two grains of quinia in ague. He attributed the neglect of conium as useless, to the administration of too small doses.

Therapeutical Uses.—There was only time to refer to its beneficial action in the convulsive diseases of children. It is pre-eminently a children's remedy. He gave it to a child one and three-quarter year old suffering from laryngismus stridulus and convulsive cough on excitement: he began with twenty minims, then thirty minims, forty minims, and increased it up to two fluidrachms and a half. There was no appreciable effect till he took forty or fifty minims. There was one attack in the first five weeks (previously one in two weeks), and the child completely recovered. In another case there was a complete tetanic condition of the muscles of the feet, with hyperæsthesia, drawing in of thumbs, contraction of hamstrings, etc., in a child two and three-quarter years old; there were tetanic attacks every now and then, lasting from five minutes to several hours. It got better under the use of conium, but, having omitted it for a time, relapsed, but on resuming it completely recovered.—Abstract from *Gulstonian Lectures in Med. Times and Gaz.*, March 21, 1868.

6. *Action and Therapeutical Uses of Belladonna.*—Dr. GEO. HARLEY administered physiological doses, short of toxic effects, to man, the horse, and the dog. The method usually adopted was subcutaneous injection, and the solution one of sulphate of atropia. To man this was administered in doses varying from $\frac{1}{16}$ th to $\frac{1}{8}$ th of a grain. The symptoms were more or less delayed and powerful according to the dose, but the sum of its action seemed to be as follows: After a few minutes there was a rather sudden acceleration of the pulse from twenty beats to double its previous frequency; its volume and force were also augmented; the temperature was increased about 1° F. externally and slightly internally, and there was heaving of the carotids, also giddiness, heaviness and somnolency, nervous delirium and startings; dryness of the tongue, palate, and throat, with huskiness of voice; a dry brown fur on the tongue, which was usually moist at the tip and edges; gradual and increasing dilatation of the pupils. In two or three hours the dryness of throat and tongue gives way, and there is a very acid viscid secretion, of a fishy odour; then the pulse falls, but the pupils are in their highest state of dilatation. There is no effect on the respiration; occasional sighs and prolonged yawns. After the pulse assumes its ordinary rate the giddiness passes off, and he seems the same as before; but he feels languid, and there is dulness of mind and diminution of vision. Headache during these symptoms or afterwards is rare and exceptional. Desire for food soon returns, but during the action of the drug insalivation or deglutition is impossible. The same accelerating effect on the pulse was observed on giving it by the alimentary canal, and with succus belladonnæ there were exactly the same symptoms, only altered in rapidity.

Conditions interfering with its Action.—1. Children are remarkably insusceptible, and occasionally bear very large doses before cerebral symptoms and dryness of throat are produced. But dilatation of pupil occurs as rapidly in the young as in the old. 2. Among adults some are more susceptible than others: it is doubtful whether pregnancy does not fortify against it. 3. Fixed caustic alkalies decompose the active principle, but only after a time; if taken immediately on mixing, its power is unaffected.

Results of Action and Mode of Elimination.—The kidneys are very active in its elimination from the minute it enters, and in two, or at most three, hours, all is removed. This occurs at all ages and in all conditions of the kidney. It is easily detected by its action on the pupils, and its presence can be easily proved

if only $\frac{1}{60}$ th of a grain of sulphate of atropia has been given; as the urine is generally retained, this is useful in a medico-legal point of view. During the operation of belladonna the amount of urea excreted is increased, and the amount of sulphates and phosphates still more so, while the chlorides are usually diminished. The urine is increased in quantity and specific gravity. There is no increase in the uric acid, but sometimes a diminution. Hence it will be seen that it has a very similar effect to febrile action, perhaps from the same influence upon the sympathetic system, to which it is a powerful stimulant; but if its action is continued sufficiently long, the vaso-motor nerves are paralyzed, and dilatation of the vessels occurs. The excessive oxidation required to furnish the phosphoric and sulphuric acids is from the increased activity of oxidation in the lungs. It is a powerful diuretic, and has the same effect on the other glands, not excepting the salivary. The drying of the mucous membrane in the upper part of the respiratory passages, the browning of the tongue, etc., are difficult to explain. The conjunctivæ are sometimes slightly dry, often injected.

Therapeutical Uses.—1. It is a powerful *cardiac stimulant*. There is no other medicine equal to it; hence it is useful in many cases of syncope and cardiac asthenia; $\frac{1}{60}$ th of a grain of the sulphate is generally sufficient. 2. It is *diuretic*, excites the sluggish circulation and torpid kidney. In acute nephritis it calms the nervous irritation and contracts the dilated vessels. In chronic albuminuria it appears to diminish the excretion of albumen. It is a safe medicine in nearly all conditions of the kidney, and tends to keep that organ in a state of healthy excitement. 3. It *promotes oxidation* in the system. Hence it is useful in the uric acid and lactic acid diatheses. If $\frac{1}{50}$ th to $\frac{1}{30}$ th of a grain of the sulphate is injected in the neighbourhood of joints affected with rheumatism, the pain is immediately diminished.—*Ibid.*

7. *Action of Sulphate of Atropia.*—A very elaborate research was made by the late Prof. A. von BEZOLD and by Dr. FRIEDR. BLOEBaum into the action of sulphate of atropia (*Untersuchungen aus dem Physiologischen Laboratorium in Würzburg, Ites Heft, 1867*). The more important of their results may be thus stated: 1. *Action on motor nerves and on striated muscular fibre.* Sulphate of atropia does not affect the muscular irritability, but it diminishes the irritability of the peripheral terminations of the motor nerves, and also of the nerve trunks: in one experiment on a frog, complete paralysis of the motor nerves was caused. This action is not an early and prominent one as in curare-poisoning, for it appears only after a large dose of the poison has acted for a long time. 2. *Action on sensory nerves.* The authors are inclined to think that this poison paralyzes the cutaneous terminations of the sensory nerves, but their examination of this effect is not yet concluded. 3. *Action on the circulation.* In rabbits, small doses (between $\frac{3}{60}$ ths and $\frac{4}{60}$ ths grain) increase the blood-pressure and the frequency of the heart's action; medium doses (between $\frac{1}{60}$ th and $\frac{2}{60}$ ths grain) produce transitory lowering of the blood-pressure and quickening of the heart's action; large doses (one grain and a half) produce sudden stoppage of the heart's action. In dogs, almost any dose quickens the heart's action, and by appropriate doses the beats may be tripled and even quadrupled. When the heart's action is quickened, irritation of the peripheral portions of the divided vagi does not arrest or at all affect it; the vagi nerves are, therefore, paralyzed by this poison. The vagi may be paralyzed in rabbits and dogs by doses too small to affect any other nerve (about $\frac{7}{60}$ ths of a grain for rabbits, and $\frac{2}{60}$ ths for dogs). 4. *Action on respiration.* The respirations are at first increased in frequency and then diminished. 5. *Action on unstriated muscular fibre.* The intestines, bladder, and uterus lose their irritability, partially, when small doses, and, completely, when large doses are given. They are also paralyzed when large quantities are topically applied. 6. *Action on the iris.* Von Bezold and Bloebaum believe that atropia never increases, but always diminishes the excitability of the muscular fibres and nerves in the iris. It first paralyzes, more or less completely, the end-organs of the oculo-motor nerve, and then diminishes the excitability of the circular muscle. The effect on the fibres of the radiating muscle is less powerful,

because the end-organs of the sympathetic nerve by which it is supplied are less affected than those of the oculo-motor nerve in the circular muscle.—*Journal of Anatomy and Physiology*, May, 1868.

8. *Action of Veratrum Viride and V. Album.*—Dr. OULMONT (*Neues Repertorium für Pharmacie*, 1868, Bd. xvii. Heft. 3, p. 177) publishes some interesting observations and experiments made on man, dogs, rabbits, and frogs, with veratrum viride. When small, non-fatal doses were given to the lower animals, the symptoms were localized chiefly in the digestive, respiratory, and circulatory symptoms, and on the general force. In the digestive system, they consisted of nausea, of vomiting, which sometimes lasted for twenty hours, and of diarrhoea. If doses sufficient to cause death were administered, these symptoms occurred in an excessive degree, but no signs of inflammation could be discovered. The respirations were powerfully affected at an early stage; they were, sometimes, unequal and irregular; they were, sometimes, diminished in number to two or even one in the minute; and, in frogs, they were, sometimes, altogether stopped. The rapidity of the circulation was soon diminished, the pulse being often reduced within fifteen minutes by from twenty to forty beats in the minute. The effect on the temperature was somewhat less marked. It falls two, three, or five degrees in from an hour and a half to two hours, and it may remain at this reduced point as long as twenty-four hours. The hyposthenic action is nearly immediately produced, and the weakness and sinking of the general force are prominent effects of large doses; but even when these are sufficient to cause death, neither muscular stiffness nor convulsions ever occur. The latter symptoms, however, are the special characteristics of the action of veratria. For the purpose of comparison, Oulmont examined the action of veratrum album. He found that it is distinguished from that of V. viride by the greater violence of its effects on the digestive system, where it always produces inflammatory lesions, and by the greater rapidity of its action. Finally, the action of the alkaloid veratria, was investigated with the somewhat unexpected result, that it is not the true active principle of veratrum. Some V. viride was completely freed from the alkaloid, and an ordinary dose given to an animal; the effects were in all respects the same as those of the usual preparations. Oulmont concludes that veratrum viride is a cardiac poison analogous to digitalis, from which it is distinguished by its extraordinary rapidity of action. This investigation is of special interest as, until now, a considerable amount of uncertainty has existed as to its exact physiological action.—*Journ. Anat. and Phys.*, May, 1868.

9. *Physiological Action of Théine.*—Chemical analysis has shown that tea contains the same crystallizable, nitrogenized principle as coffee and cacao. Dr. LEVEN conceived that it would be useful to determine by experiments whether the physiological effects were the same. Having already experimented with caffeine (see No. of this Journal for April, 1868, p. 525), he determined to experiment with théine on frogs and guinea pigs. The following are his conclusions:—

1st. Théine and caffeine, considered as one and the same alkaloid by chemists, seem to produce different toxic effects on animals submitted to their action.

2d. Théine is a less powerful toxic than caffeine, and it is only when given in double doses that the former produces the toxic effects of the latter.

3d. Théine also produces convulsive movements in the limbs, which Dr. L. has not observed from the action of caffeine.

4th. In other respects their physiological effects are identical. Both alkaloids seem to directly excite the heart and respiratory movements and to increase arterial tension. By exciting the circulation, they stimulate the central nervous system, the brain and spinal marrow; but they do not arrest the functions of the spinal cord and nerves. The tetanic convulsions resulting from their action is caused by the stimulation of the spinal cord. They do not abolish the functions of muscle; the heart does not cease to beat immediately after death.—*Archives de Physiologie Normale et Pathologique*, May–June, 1868.

10. *Nasturtium Officinale*.—Surgeon-Major JOHN WYATT thinks that (*Brit. Med. Journ.*, April 11, 1868) this efficient vegetable alterative in the treatment of cachectic diseases, has not received the consideration it deserves. He says a very efficient preparation has been made by Messrs. Savory and Barker, at his suggestion, and is named “liquor nasturtii.” It contains all the active principles of the plant in a very palatable form. Of course, everybody is aware of the valuable antiscorbutic properties of the ‘cruciferæ’ generally, and of the peculiarly palatable relish of the fresh plant on the table; but independently of this well-established character, he does not think that its value is sufficiently appreciated as a vegetable alterative for that numerous class of cases of cachectic blood-diseases which is so often to be observed amongst the poorer classes in densely crowded towns, and which morbid deterioration is probably due, in a great degree, to the deficiency of succulent vegetable element in their vicarious diet. He has during several years past been in the habit of employing the liquor nasturtii as a prophylactic in such conditions, with the best possible results. No official preparation of the plant exists in the *British Pharmacopœia*; but in that of 1788, a preparation called the ‘succus antiscorbuticus’ was to be found; and, in the Parisian *Codex*, there are two valuable preparations—the ‘succus’ and the ‘sympus antiscorbuticus,’ the chief ingredients of which are the water-cress, scurvy-grass, and buckbean. The memorable campaign in the Crimea practically taught the incalculable value of even such snatches of vegetation as could be procured from the banks of the rivers; and, Surgeon W. says, “Well do I remember the appetizing sight of the little dishes of indigenous salad to be seen so often in the French camps, composed of a small species of water-cress, dandelion, and sorrel; while our men were feeding strictly on the regulation food, and suffering in consequence.”

11. *Carbolate of Quinia*.—Prof. WENZEL remarks (*Jahrbücher der Gesammten Med.*, Aug. 28, 1867), that carbolic acid, which in solution acts as a poison upon the lower animal organisms, is borne in proportionate, though large doses, by the higher animals and man, when introduced into the body in a diluted state. It was administered to some animals with advantage in their food in England at the time of the rinderpest. With bases, even weak ones such as quinia, carbolic acid loses in a great degree its irritating properties at the point where it is applied; when combined in the proportion of two equivalents of the acid to one of quinia, the compound is characterized by a slight sharpness, and a decidedly bitter taste. Professor BERNATZIK proposes a preparation composed in this manner, and he hopes that it will prove an energetic disinfectant for internal use. G. BRAUN has given it with benefit in puerperal diseases, and DUCHEK in several typhous cases, and in one of pyæmia. Pills containing 1 grain of quinia with .6 of a grain of carbolic acid were given repeatedly without causing the slightest inconvenience, and according to these statements 3 to 6 grains of carbolic acid were given daily without injury. The compound was prepared by dissolving 60 parts of carbolic acid with 100 of quinia, in 300 of highly rectified spirit, filtering the solution, distilling and evaporating to the consistence of turpentine, and then mixing some extract of acorus and powdered cassia.

12. *Epispastics as Exciting and Depressing Agents, and their Influence on the Pulse and Animal Heat*.—Dr. O. NAUMANN in former investigations had arrived at the conclusions, 1. That the therapeutical action of cutaneous irritants is brought about only in a reflex manner; 2. That a proportionately powerful irritation of the skin diminishes the power of the heart and arteries, and acts hyposthenically; 3. That a proportionately feeble irritation of the skin increases the power of the heart and arteries, and acts hypersthenically; 4. That the place where the irritant is applied is, for the most part, a matter of indifference in regard to the result required; and 5. That in general an amount of irritation corresponding to the circumstances alone regulates the therapeutical effects. In the present communication Dr. Naumann relates the results he has obtained by the aid of the hæmadynamometer prepared by himself. He finds that an intense irritation of the skin very rapidly produces a diminution of the frequency and especially of the strength of the pulse. This diminution of the

pulse is usually preceded by a stage of excitement, which, however, is soon passed. The diminution of the pulse in several cases attains its maximum, during the irritation, but often only after it has ended, but it continues a long time after the irritation has ceased. The frequency of the pulse is, for the most part, somewhat increased at the commencement of a powerful irritation of the skin, but during the irritation and sometimes after it, it is retarded, and this retardation often continues for a long time after the irritation has ceased; but this occurs much less frequently than a diminution in the strength of the pulse. In reference to the changes of temperature, it was observed as a constant result that a powerful irritation of the skin produced a remarkable diminution of the animal heat. But generally this cooling is preceded by a greater or less elevation of the temperature, the duration of which seems to depend on individual peculiarities, and may be extended beyond the time of the irritation before cooling begins. The above mentioned changes produced by cutaneous irritation take place in the normal conditions of the body, but still greater alterations are to be expected in cases of disease. In the so-called synochal diseases, the irritability of the body, and the reaction from irritants is usually increased, and is exhibited, for instance, on the application of a mustard poultice, in a well-marked cutaneous inflammation visible to the eye. The reverse is the case in the so-called asthenic conditions, in which the operation of epispastics is much weaker, or is not exhibited at all, and thus it may be explained how the same cutaneous irritant may act in very different ways, and may operate as a depressing agent in so-called synochal diseases, and as a stimulating one in asthenic cases, as in threatening collapse. The results of the present investigations made by Dr. Naumann are summed up by him in the following manner: 1. The changes produced by an irritation of the skin continued for a long time, last also for a long time after its discontinuance, and in general the length of the time corresponds to the long continuance of the irritation, and in healthy persons the changes may be observed half to three-quarters of an hour after the irritation. 2. The weakening of the pulse caused by a powerful cutaneous irritation often attains its maximum during the irritation, but often only at the end of it. 3. The exciting action of the proportionately feeble cutaneous irritants also continues for a long time after their discontinuance, but is at last equally followed by weakness which, however, appears much later, and in a much less degree than after the application of a strong irritant. 4. After powerful irritation of the skin, there constantly arises, for the most part after a longer or shorter interval of heating, a diminution of the animal temperature, which has often not reached its termination half an hour after the discontinuance of the irritation. 5. The interval of heating differs very much in its duration, and the cooling often occurs during the irritation, and often immediately after its cessation.—*Brit. and For. Med.-Chir. Rev.*, April, 1868, from *Schmidt's Jahrbücher*, March, 1867.

13. *Ozone*.—Dr. H. DAY, in a report on this article made to the St. Andrews Medical Graduates' Association, gives the conclusions at which he has arrived, the most important of which we subjoin:—

There can be no escaping, at this moment, from the theory that ozone is a modified condition of oxygen, indeed, is oxygen plus force, which force is probably used in condensation—in other words, the power or capability of oxygen to combine with itself.

For the production of ozone in the laboratory, no method is so good as that accomplished by the aid of the induction coil. The production of ozone in the air, if it be there, is not yet in any way definitely understood.

The ordinary tests for ozone are imperfect, not because they will not prove the presence of ozone, but because they prove too much—that is to say, the presence of other bodies also common to the atmosphere.

In its action on the body the effects of ozone seem to be, confined to the respiratory passages and structures, in fact, it is purely local in its action, resembling closely diluted chlorine and diluted bromine in vapour, the phenomena induced, varying in intensity, may be catarrhal, bronchial, or pneumonic, nor is there any evidence of any other class of diseases from ozone.

On dead matter, ozone exerts a powerfully destructive action, resembling in this way chlorine, iodine, and especially bromine.

Ozone is a disinfectant and deodorizer belonging to those bodies which disinfect and deodorize by resolving and decomposing into primitive and innocuous forms, competing in this respect with substances already named—*i. e.* chlorine, bromine, and iodine. It possesses these qualities in a less degree than chlorine and bromine, and is, in many cases, not so applicable as iodine.

As a preventive of disease, ozone can only act by destroying organic animal poisons, in which respect it may be compared with the substances I have more than once named. With regard to the disinfecting and deodorizing powers of ozone, I would refer you to the opinions of the late Dr. Barker, contained in the Hastings prize essay for 1865. The subject of comparison, and indeed the whole subject of deodorizing and disinfecting, is there so admirably, so exhaustively discussed, as to leave, it seems to me, nothing further to be said on the subject.

Lastly, as a remedy. In the form of ozonized oil, of ozonized ether, and ozonized water, it once more ranks with a similar combination of remedies, containing chlorine, bromine, and especially iodine. Whether, in any respect, it may prove to have greater advantages than the last named trusty and ready agent, can only be conclusively arrived at by determining whether it will do what iodine will *not* do, and this can only be decisively made out by applying to it the test of inductive philosophy—a rigid exclusion of all that is ineffective.—*Med. Press and Circular*, Jan. 15, 1868.

MEDICAL PATHOLOGY, SPECIAL THERAPEUTICS, AND PRACTICAL MEDICINE.

14. *Intermittent or Paroxysmal Hæmaturia*.—The *Edinburgh Med. Journal* for May, 1868, contains some interesting remarks on this disease, with an account of four cases by Dr. EDWARD HEADLAM GREENHOW. Dr. G. says that in all the cases which he has seen of this disease, “the attacks have been excited by the same cause, have taken the same form, exhibited the same general group of symptoms, and run the same definite course. The immediate exciting cause of the attacks has been invariably some definite exposure to cold or wet. The form taken by the attacks has been invariably paroxysmal, the paroxysms coming on suddenly, almost immediately after the chill was experienced, and passing off rapidly when the effects of the chill had been counteracted and the patient had become thoroughly warm. The general group of symptoms has been invariably the same, the additional ones occasionally exhibited being apparently due to an unusual degree of constitutional disturbance. In every instance the paroxysms have begun with coldness of the extremities, followed by general chilliness, amounting in the severer attacks to rigors. In like manner, in every case, the chilliness or shivering has been attended by a feeling of weight and pain in the loins, and by pain or a sense of weakness or stiffness in the lower limbs. The chilliness has been usually, though not always, followed by an imperfectly marked febrile hot stage. The patients have invariably passed, during the paroxysms, urine looking as if it were mixed with blood, and identical in general character. And, lastly, the same definite course has been run by the paroxysms in every case. From half an hour to two hours after the chilliness or rigors the patient has never failed to pass the first dark-coloured urine, which has always been highly albuminous, and has contained numerous crystals of oxalate of lime, with more or less of brownish, or yellowish-red, amorphous granular matter and a few hyaline casts, but only occasionally some stray blood-corpuscles. At each succeeding micturition after the chilliness, the urine has invariably shown more or less diminution of colour, of albumen, of oxalate of lime, and of its other abnormal contents; resuming its natural character and appearance by the second or third micturition after slight attacks, and usually

by the fourth or fifth after severer paroxysms. By the second day after an attack the patients, as a rule, have regained their ordinary degree of health and strength, and have continued well until some fresh exposure has brought on a new attack of their complaint. To this summary I may add, that, so far as my observation extends, all the patients suffering from this disease have had the same pale, sallow, cachectic aspect, two of them having been distinctly jaundiced, and the others having all had at times an icteroid tint of skin.

"It appears to me that this train of identical circumstances, in so considerable a number of cases, places it beyond question that intermittent, or, as I think Dr. Pavy more accurately terms it, paroxysmal hæmaturia, is a definite disease, due in all cases to the same remote constitutional cause. It is quite certain that the only medical treatment which appears to have any effect in diminishing the liability to suffer from the paroxysms on every exposure, is treatment directed, during the intervals, towards the improvement of the general health and the strengthening of the patient's constitution. Once the paroxysms have set in, the most simple means for restoring warmth are all that I have found it advisable to use. The short duration of the paroxysms, the very general absence of blood-corpuscles from the urine, even at the time of the paroxysms, and the complete recovery of the normal character of the urine within a few hours after their subsidence, seem to show that there can be no cause of hemorrhage in the kidneys themselves, but rather that the disintegrated blood transudes through the walls of the bloodvessels in the Malpighian bodies. Indeed, I regard the kidneys rather as the organs of elimination than as the seat of the disease, and I consider the renal irritation, the existence of which is manifested by the pain in the loins and by the presence of casts, and occasionally also of stray blood-corpuscles in the urine, to be a secondary affection consequent upon congestion of the kidneys produced by the sudden and unusual strain thrown upon them. Possibly the paroxysms may consist in the sudden disintegration of an unusually large quantity of blood-corpuscles, setting free so considerable an amount of hæmato-globulin that it cannot undergo the normal changes, but is eliminated through the kidneys in a comparatively unaltered state."

15. *Catarrhal Icterus*.—Catarrhal icterus, and icterus accompanying poisoning by phosphorus, are produced, according to Virchow, by a catarrh of the intestinal portion of the common bile-duct. The sudden dilatation, and intense colouring, of this duct, together with the obstruction and the coloration of the intestinal portion of the duct, furnish the proofs on which the Berlin Professor relies. But the dilatation of the common bile-duct, and the deep colouring of this duct and of the hepatic-duct, are wanting in many cases. Dr. O. Wyss, who has had the opportunity of observing many cases of poisoning by phosphorus, has not been able to discover the presence of these lesions; and has not even been able to find the mucous plug which, according to Virchow, should be found obstructing the terminal portion of the common bile-duct. The undilated biliary ducts contained a colourless thick mucus; the walls were coloured by bile, and the intestine did not contain any bilious fluid. In order to elucidate this point, M. Wyss examined whether animals having biliary fistulæ became icteric after poisoning by phosphorus. If the icterus were due simply to the obstruction of the intestinal portion of the common bile-duct, it would, in this case, be absent, as the bile would freely escape outwardly. Several dogs, having biliary fistulæ, were poisoned by an injection of phosphorized oil into the rectum. By this method, the vomiting which follows phosphorized injections into the stomach was avoided. The results were as follows. The dogs all had icterus; the urine contained biliary acids. During the icterus the bile did not flow continuously as before the poisoning; sometimes it was mixed with a considerable quantity of mucous matter; sometimes the flow was completely stopped. A thick colourless mucus, which could be removed by forceps, accumulated in the fistulous passage; after its removal, some drops of bile flowed. The conclusions to be drawn from these experiments are the following: 1. The icterus observed in phosphorus-poisoning is a true catarrhal icterus; for observers have remarked a catarrhal affection of the biliary ducts, accompanied by a copious secretion of mucous matters. 2. Catarrhal icterus is not attributable to a catarrh of the

intestinal portion of the common bile-duct, but to accumulation of a thick mucus in the small canals, which are thus obstructed, so that biliary stasis arises. 3. Bile is not present in the hepatic duct and common bile-duct, when the channels leading to these have become impermeable to this fluid. When all these small canals are not choked, the bile may flow in greater or less quantity. The author, while admitting the possibility of the obstruction of the intestinal portion of the common bile-duct, does not think that it ought to be held as the cause of catarrhal icterus.—*Brit. Med. Journ.*, March 14, 1868, from *Archiv der Heilkunde*, 1867.

16. *Production of Artificial Tuberculous Disease by Subcutaneous Irritation, and also by Inoculation with Tuberculous Matter.*—Dr. SANDERSON exhibited to the Pathological Society [London], a series of Microscopical specimens illustrative of the disease produced in guinea pigs by certain modes of subcutaneous irritation, and particularly by the insertion of tuberculous matter in extremely small quantities under the skin. In co-operation with the President he had made very numerous experiments on the subject. As regards the subcutaneous inoculation of tuberculous matter, the results of previous experiments had been in the main confirmed, and it had been found that the anatomical changes so produced were remarkably constant in their character and development. As regards other modes of subcutaneous irritation, whether consisting in the insertion of morbid products under the skin other than tubercle, or in irritating the subcutaneous areolar tissue mechanically, it had been found that, provided the local irritation was of sufficient duration, and yet not of such intensity as to produce speedy death, morbid changes occurred in the internal organs which were of the same nature as those which result from the inoculation of tubercle. The appearances may be best described in the order of their development. The subcutaneous lesions consist in induration and suppuration of the subcutaneous connective tissue at the point of insertion, and in the formation of secondary abscesses or indurated nodules, often in great numbers, in the neighbourhood, these being often connected with the primary one by cords of induration. The indurated parts consist of transparent fibrillated stroma, studded with staff-shaped nuclei. In microscopical sections of the walls of these abscesses all forms of nuclei could be observed, those nearest the cavity being round, those found in the surrounding induration being staff-shaped, while those between were spindle-shaped. In the indurated parts nests of round nuclei occurred; they often surrounded minute arteries. The morbid appearances in lymphatic glands consist in enlargement, induration, and caseous degeneration. These changes are in most cases limited to those glands which receive tributaries from the seat of insertion or irritation. The caseation may result either in softening or in the formation of cretaceous concretions. In some cases the same processes are observed in other subcutaneous lymph-glands. In the lungs disease is to be found in about 9 per cent. of infected animals. The characteristic lesion consists in the formation of nodules of gray induration. The nodules occur both under the pleura and in the depth of the organ. They have the semi-transparent appearance of milary tubercles. Frequently the largest do not exceed a pin's head in size. Their colour varies from pale gray to iron gray. In the larger ones the gray semi-transparency is confined to the outer part, the centre being yellow and opaque. In microscopical sections of minute nodules, it is seen that each consists of a kernel, outside of which is a more transparent rind. The kernel, which may be enucleated with the point of a needle under the microscope, is more opaque and usually denser than the rest. The cortex consists of lung tissue, in which, in the first place, new growth has taken place in the walls of the alveoli, so as to convert them from transparent structureless membranous partitions into cellular or vesicular septa; while, secondly, epithelial cells dotted with pigment granules have accumulated in the alveolar cavities. The kernel contains in general no epithelial elements. It is a mass of spherical nuclei, remarkably uniform in size, which occupy the loculi of a transparent non-fibrillated stroma—i. e., a solid transparent substance modelled into holes, in which the nuclei lie. This structure has a remarkable resemblance to that of the pulp of the lymphatic glands. In the liver the

changes observed are of remarkable interest, and have not been hitherto described. The organ is enlarged to twice or three times its weight, and becomes deformed like a cirrhotic liver. The enlargement and deformation are alike due to the development of adenoid tissue around the branches of the portal vein and their accompanying bile ducts, consisting entirely of adenoid tissue—*i.e.*, of a tissue in which nuclei occupy the holes of a transparent loculous stroma. In the spleen the most important morbid alteration is enlargement. The organ is sometimes nearly thirty times its natural weight. This enlargement is often not accompanied with any apparent disease. But in most instances the organ is scattered, both superficially and deeply, with nodules of semi-transparent material, which, to the naked eye, most strikingly resemble military granulations. On microscopic examination these exhibit no characters by which they could be distinguished from the Malpighian corpuscles of the spleen on the one hand, or from the new growths already described in the liver on the other. In the peritoneum, the appearances are such as to throw great light on the whole process. They may be studied in the mesentery. When the diseased membrane is examined with a lens, its surface is seen to be scattered with grains of very various size, some microscopic, others distinguishable to the naked eye. These consist in little masses of spherical nuclei. They are always situated in the neighbourhood of arteries. In their relation to the smallest arteries, the appearances recall those so familiar to every one in the arteries of the pia mater when affected with tubercle. The outer wall of the artery bulges out so as to form a spindle-shaped swelling consisting of nuclei, which, although they lie outside of the muscular coat, appear to form part of the arterial wall. But to the larger arteries their relation is different. Here the little granule is separate from the artery, and lies not merely outside of its muscular coat, but outside of its adventitia. The corpuscles of which these granulations consist are, beyond the possibility of a doubt, homologous with connective-tissue corpuscles of the part in which they are developed. From the transparency of the tissues, and the readiness with which they can be examined, even with high powers, with scarcely any dissection, they afford a splendid opportunity for studying the process by which tubercular granulations originate—*viz.*, the proliferation of nuclear corpuscles. Dr. Sanderson proceeded to state the grounds on which he had asserted that the remarkable anatomical results he had described could be produced in rodent animals not merely by the inoculation of tubercle, but by any irritation of the requisite degree of intensity applied to the subcutaneous tissue. He had arrived at this conviction gradually. It had been first found that the morbid process of which the lesions in the internal organs are the expression can be set up not merely by tubercle in the strict sense, but by any of the inflammatory products which are associated with it. Then, from numerous experiments with pyæmic pus, it had appeared that although most of the animals died of the immediate effects, those that survived became ultimately tuberculous. Lastly, it had been ascertained that if subcutaneous suppuration were produced by purely mechanical means—as, *e.g.*, by the introduction of setons—the same result followed. In an animal killed four months after the insertion of setons, the condition of the internal organs had been found to be altogether indistinguishable from that due to inoculation. From the facts related it is evident that experiments afford no ground for believing in the existence of a tuberculous virus. They seem, however, to throw an important light on the genesis of the tuberculous process. If we are entitled to assume that the process set up in these animals is in reality tuberculous, they certainly seem to afford support to the doctrine which has for some years been taught by Niemeyer and some other pathologists in Germany, according to which the military process—the formation of gray granulations—takes its start from the caseous degeneration of some previously existing pathological product; for if he rightly interpreted the facts, the enlargement and caseation of the lymphatic glands nearest to the irritated part constitute a necessary link in the chain of pathological events by which the primary results of local subcutaneous irritation are connected with the tuberculization (if we may call it so) of the internal organs.—*Med. Times and Gaz.*, April 18, 1868.

17. *On the Nature of Rheumatic Inflammation and the Cause of its Migratory Character.*—Dr. HENRY W. FULLER read before the Western Med. Soc. (Oct. 18, 1867) a paper on this subject. The points insisted upon by him were: 1. That rheumatic inflammation is identical with ordinary inflammation, modified in its results by the nature of its exciting cause, by the state of the system, and by the briefness of its continuance in one locality. 2. That its frequent migration is to be traced partly to its cause, viz., a morbid condition of the blood, partly to the check of elimination wherever inflammation is set up, and partly to the counter-irritant effect of the inflammatory action excited at the parts last affected. With a view to establish his first proposition, Dr. Fuller asked in what particular does rheumatic inflammation differ from common inflammation. Under ordinary circumstances inflammation is set up, either as the result of some structural injury, or, of some cause of irritation, which, by its long continuance, keeps up and aggravates the original mischief. In either case, the vitality of the part is so far reduced that suppuration is almost inevitable. But sometimes inflammation is due to some temporary cause of irritation; and, though for a time of much apparent intensity, does not produce any great depression in the vitality of the part unless the cause of excitation be kept up, or the sufferer be cachectic or out of health. This, if rest be enforced, is the common result of the inflammation which sometimes attacks the glands in the groin, after too great, or too protracted exertion, or follows the application of a blister; as also of that which ensues on a sprain or other trivial injury. The articular inflammation of rheumatism is analogous. It does not arise from structural injury, nor is it excited by rapidly depressing agency; it is due to the irritation of a poison, the presence of which gives rise to excitement rather than depression. Thus, as the primary cause of local mischief does not excite a depressing influence, as the inflammation itself is migratory, and as the joints when attacked are kept quiet, and free from extraneous irritation, the vitality of the structures implicated is not under ordinary circumstances endangered. But when the vitality of the parts is seriously implicated, as it is sometimes in cachectic persons, even by an ordinary attack of rheumatic inflammation; as it is even in healthy persons, when inflammation persists in one locality; and as it is more especially when the existing inflammation is kept up by mechanical means, as by the constant action of the heart and lungs when the pericardium or the pleura is implicated, then the ulterior effects of inflammation are produced, and suppuration is by no means unfrequent. Dr. Fuller traced the migratory nature of rheumatic inflammation to the same laws which operate in producing other metastatic phenomena in health or in disease. All metastatic phenomena are connected with the presence of certain materials in the blood, and appear to be excited by causes connected with their elimination. In health, no sooner is one secretion checked, than some other secretion is increased. But metastatic phenomena take place under two opposite conditions: either when the function of some excretory organ is suspended or repressed; or else when one of the excretory organs is stimulated to an inordinate degree. Thus if the perspiration be checked by the influence of cold, the kidneys take on vicarious action; whilst if the skin-action be excited, and perspiration ensue, very little urine is voided. In disease the same reciprocity of action is observed, and may be traced in almost all disorders connected with a vitiated condition of the blood. To repress an eruption is tantamount to exciting a violent action in some other part of the body; to stimulate the skin, and induce the appearance of an eruption, is to calm the system and to diminish or check the continuance of any abnormal action which may be taking place elsewhere. Medical interference clearly exemplifies the principle of metastasis, and shows it to be the same in disease as in health. It proves that when any local action is induced by a vitiated condition of the blood, metastatic phenomena may be caused by the arrest of that action, and also by the setting up of an action elsewhere, whereby the poison is determined to such part in preference to that at which its action has been previously manifested. In acute rheumatism, both these causes of metastasis are in full operation, and each contributes its share towards producing the phenomena of the disease. Wherever rheumatic inflammation is set up, almost perfect suspension of cutaneous action is

induced. The rheumatic poison, which has a tendency to escape from the system, by means of the profuse cutaneous excretion, is baulked by the stagnation which its own action has induced; its extrication at the inflamed joints is prevented, and thus is imparted a tendency for it to seek some other mode of escape. Sometimes this is the only cause of the metastasis observed in rheumatism, but more commonly the counter-irritant effect of inflammation taking place in other parts of the body combines to induce the cessation of inflammation in the parts previously affected.—*Brit. Med. Journ.*, April 11, 1868.

18. *Specific Character of Varicella.*—Dr. L. THOMAS (*Arch. der Heilk.*, 1867, 4) adduces in support of his view of the specific character of chicken-pox the following reasons. 1. The form of the eruption. 2. The manner in which the development of the pock occurs. Its appearance, maturation and disappearance take place more quickly and with greater uniformity than does the pock in variola. 3. Varicella occurs more frequently as an epidemic than variola. 4. The disease is confined most commonly to the age of childhood. 5. The failure of vaccination to afford any protection against the occurrence of chicken-pox. 6. The course of the disease; absence generally of prodromata; the slight increase of temperature during the eruptive stage. The height of the disease lasts from two to three days, with fever of an intermittent type. Its decline is then very rapid, being completed often within twelve hours. The entire duration of the febrile stage is from three to four days. The eruption begins to appear often towards the end of the first day or at the commencement of the second, seldom later. The pocks either appear at once as full-formed vesicles, or these are quickly developed from a slight lenticular hyperæmic spot. By the second day after their appearance the contents of the vesicles become turbid, and then quickly drying form a yellowish or brownish crust. A few new vesicles are now often developed. The course of varicella is strictly typical; being pretty uniform in every case. 7. The chicken-pox cannot be propagated by inoculation with the contents of the vesicles. 8. The period of incubation in varicella does not appear to have so uniform a duration as in variola, in which exanthem it is of a determinate length.—*Vierteljahrsschr. f. d. Prakt. Heilk.*, No. xxv., 1868. D. F. C.

19. *The Dry Catarrh of Children.*—Under this name STEINER describes in the *Jahrbuch. f. Kinderheilkunde* (1868, 1-25), a condition of the air-passages occurring in children during the prevalence of an epidemic catarrh. There was hyperæmia with swelling of the respiratory mucous membrane. The bronchi presented no accumulation of mucus indicating increased secretion. The lymphatic glands along the trachea were enlarged, dark red, and had under gone at their centre a caseous metamorphosis. The disease was attended with extreme dyspnœa, and with frequently recurring paroxysms of coughing. The cough was in general dry and whistling, but without râles of any kind. There was no discharge of sputa. Even in cases where the disease lasted for weeks or even months the cough retained throughout its dry character. Percussion over the lungs gave a loud and more or less tympanitic sound. By auscultation a rough vesicular respiration was detected, with a whistling, rattling sound. It was only towards the close of fatal cases that the vesicular character of the respiration diminished. They were, in most cases, unattended with fever. When, as frequently took place, symptoms of congestive hyperæmia of the brain set in, the disease ordinarily proceeded with rapid steps to a fatal termination. Its subjects were for the most part the children of the poor who were badly sheltered and badly nourished. The immediate cause of the disease, as observed by Steiner, was the same which gave rise to the wide-extended catarrh which prevailed at the same time and place, and attended with great difficulty of respiration. In cases occurring in adults, it is supposed that an emphysematous condition is first produced, and to this is due the dry cough.

In the treatment of the disease, Dr. S. employs the vapour of hot water; and to excite the normal secretion of the respiratory mucous membrane, the use of the alkaline mineral waters. From emetics, he seldom saw much good result. To subdue the difficulty of respiration and severe asthmatic paroxysms, he

employed stimulants, as benzoin, liq. ammon. anisat, tinct. ferri acetat., and external rubefacients. To quell these severe spasmodic paroxysms of coughing, Dr. S. had recourse to narcotics.—*Centralblatt f. d. M. Wissen.*, No. 14, 1868.

D. F. C.

20. *Spasm of the Glottis of Infants; its Connection with Eclampsia.*—In the 52 cases observed by Professor HENOCHE (*Berlin Klinik. Woch.* 1867, No. 19) both laryngismus and eclampsia were present in all, in 14 eclampsia alone, and in 9, simply spasm of the glottis. In the slightest grades of laryngismus stridulus, there is, remarks the professor, a transient contraction of the arytenoid muscles (*recurrent nerve*); while in other cases, the spastic excitation extends to the diaphragm and the thoracic muscles; in consequence of which there occurs transient arrest or an irregularity of the respiratory movements. There is also spasm of the muscles which direct upwards the globe of the eye, of the muscles of the fingers and toes, the flexor muscles of the forearm, with the masseter and temporal muscles. In very severe cases both sensibility and consciousness are suspended, and the case assumes all the characteristics of eclampsia; in other cases, again, the pathognomonic phenomena of laryngismus and eclampsia alternate the one with the other, or the spasm of the glottis assumes the character of an epileptiform paroxysm. In these cases the excitation is not confined to the vagus nerve, but extends to the roots of the respiratory nerve in the medulla oblongata, with irritation or disease of which latter epileptic seizures are intimately connected.

Anatomical lesions, it would seem, are not to be detected in those frequent cases in which the spasmodic symptoms disappear, as it were, spontaneously. In these cases there is probably only a simple sur-excitation of the nerves of the affected muscles, the absence of which is not detectable. The irregular nervous excitation is mostly due to an abnormal nutrition of the nerve substance from dyscrasia of the blood or to reflected irritation from some remote organ. To the first class of cases belong the greater number of those which occur in badly-nourished weakly children. Of 38 cases of spasm of the glottis, 25 were in rachitic children. A casual predisposition of such children to laryngismus should not, however, be mistaken as an indication of the dependence of the spasm of the glottis upon a rachitic dyscrasia, inasmuch as both conditions are alike capable of being produced by improper or defective food. The paroxysms of laryngeal spasm have been known to be entirely suspended by an improved diet, in respect both to the quality and quantity of the food composing it. The agency of reflected irritations in the production of glottis spasm, according to Prof. H., is much overrated. Excitation of the branches of the trigemini nerve, in cases of difficult dentition, and the concurrent sensitiveness of the nerves of the alimentary canal are generally believed to constitute a very common primary cause of laryngeal spasm. In 52 cases of laryngismus, 33 of the patients were between 9 and 30 months of age, and 19 between 2 and 9 months. It is to be recollected that rachitis occurs just as often during the period of dentition, and yet no one has imagined that rickets was caused by the latter process. In every case of glottidoteal spasm is the influence of the reflected impulse of the dental nerves and of the nerves of the alimentary canal a subordinate circumstance. Far more effective in the production of the spasm, Prof. H. believes to be the influence of cold and of the catarrhal affections of the air passages. As an occasional cause Prof. H. adduces the tension of the muscles temporarily induced by fits of violent crying, screaming, etc. Enlargement of the thymus was in no instance detected by Prof. H.

The duration of the spasmodic paroxysms was seldom protracted beyond two or three minutes. There often occur intervals between the attacks of a week's duration. Of Prof. H.'s cases four terminated fatally, partly through the sudden occurrence of asphyxia, and partly during an attack of eclampsia. Examination after death revealed a state of congestion of the intercranial veins. The remedies employed by Prof. H. in the treatment of spasm of the glottis were white oxide of zinc, in doses of from one-quarter to one grain; assafetida, in the dose of twenty grains, in an enema; musk, in doses of from one-half to one grain. From the use of these articles, however, he saw but very little good result. The

bromide of potassium, in the dose of from one-half drachm to a drachm in four hours, gave a favourable result in one case. In the majority of cases remedies adapted to improve the nutrition of the system proved superior to all others, especially a good diet, as of milk, animal broths, wine, etc., with pure air, exercise, etc. Of medicines, the most efficacious were cod-liver oil and iron. Upon such tonic treatment the disease has been known to disappear entirely within from six to eight weeks. Simple, aromatic, and malt-baths are spoken of favourably by Prof. H.—*Vierteljahrschr. f. d. Prakt. Heilk.*, No. xxv., 1868. D. F. C.

21. *Stomatitis and Pharyngitis Leucæmica*.—In *Virchow's Archives* (xlii. 444), Dr. F. MOSLER relates the case of a male 40 years old, and previously of sound health, in whom, in the course of some fifteen months, there took place gradually a swelling of the glands on both sides of the throat, attended with inflammation of the mucous membrane of the mouth and pharynx, with flaccidity of and hemorrhage from the gums, followed by swelling of the axillary and inguinal glands, and finally of the liver and spleen. There was now an evident increase in the white particles of the blood. In the case described the only etiological agent to which the morbid phenomena it presented could be referred, was inordinate exertion of mind and body. The condition of the throat was of especial interest. Its mucous membrane was red and swollen, and over its surface there were spread numerous medullary elevations having a smooth shining appearance. Both tonsils were enlarged, and their surfaces presented the appearance of a congeries of large, dense medullary knots. The secretions of the surface of the mouth and larynx and of the salivary glands, was greatly increased by talking. After a thorough rinsing of the mouth, its secretions gave an acid reaction. The patient had not suffered previously from any disease of the mouth or throat. The patient was attacked with this only after the lymphatic glands of the neck had become enlarged, and at first, with their increase or diminution the throat affection became worse or better. Finally, under the use of quinia and iron, remedies which exerted a beneficial influence on the entire morbid phenomena, the patient got well. Dr. M. believes that the form of stomatitis and pharyngitis here described is a specific disease resulting from a leucæmic dyscrasy. The inflammation of the mouth, which in its symptoms had a close resemblance to scorbutic stomatitis, was probably caused by an irritation due to some morbid chemical product in the blood and the secretions of the lymphatic glands, by which also, according to Dr. M., is to be explained the affection of the mouth met with in cases of diabetes, the nature of which is still, however, unknown.—*Centralblatt f. d. Med. Wiss.*, No. 17, 1868. D. F. C.

22. *Pachymeningitis Chronica*.—MELLENHEIMER relates (*Journ. f. Kinderkrank.*, 1868, 96–120) the post-mortem examination of a child 21 months old, who exhibited during life all the symptoms of chronic hydrocephalus. On examination after death there was found within the arachnoidal sac one quart and a half of a greenish coloured thick pus. It was encysted on both sides of the falciiform process, occupying the situation of the two hemispheres of the cerebrum. The brain itself was thrust down upon the floor of the cranial cavity, in the form of an elongated roundish mass. The walls of the cysts inclosing the pus were composed of many layers of false membrane, which, on one side was adherent to the pia mater and on the other to the dura mater. The cerebellum had undergone but little change. The medullary portion of the cerebrum presented itself merely as whitish striæ, while the convolutions were flattened. The lateral ventricles were enlarged, and the internal portions were softened, while the external gray portion was apparently but little changed. The brain was closely attached to the base of the skull by means of a dense membranous tissue, richly supplied with bloodvessels.—*Centralblatt f. d. Medicin. Wissenschaft*, No. 8, 1868. D. F. C.

23. *Epilepsy*.—The following are the outlines of a very interesting case of epileptiform disease related by Dr. MAROWSKY (*Deutsche Arch. f. Klin. Med.*, iii. 6–15): A boy had an abscess formed on his left cheek, the result of a phlegmonous tumour. Immediately upon the abscess being opened by an incision the

lad became unconscious, and was attacked with paroxysms of general convulsions which lasted from one to many minutes. The dark colour of the skin immediately surrounding the abscess at first disappeared, and a paleness extended itself over the entire cheek; the pupils of the eyes dilated, the patient became restless, and paroxysms of convulsions ensued. The relator of this case supposes that the irritation caused by the opening of the abscess was immediately reflected upon the arteries of the brain, causing a spasmodic contraction of them, and thus producing a general anæmia of the encephalon, of which the unconsciousness and the convulsive paroxysms were the result. It is worthy of remark that the patient was of an eminently excitable temperament, and had suffered from repeated nervous attacks.—*Ibid.*, No. 9, 1868.

D. F. C.

24. *Sudden Death occurring during Convalescence from Typhus Fever.*—Dr. F. SEUNIG relates (*Wiener Med. Presse*, 1868, No. 50), a case of sudden death in an unmarried female, 20 years of age, on the 29th day of the disease; in another case also in an unmarried female, 27 years old, it took place on the 22d day of the disease. In both, death occurred without any premonition and without any appreciable exciting cause. In these cases, on examination after death it was found that an extravasation of blood had taken place within the cavity of the spine at the lumbar region, consequently it was to meningeal spinal apoplexy that the sudden occurrence of death is to be attributed.—*Centralblatt f. d. Medicins Wissenschaft*, No. 9, 1868.

D. F. C.

25. *Hypertrophy of Left Side of Face, probably from an Injury inflicted on the Fœtus in Utero.*—This case is related by Dr. PASSAUER in *Virchow's Arch.*, xxxvii. p. 410. It occurred in a boy 11 years old. When pregnant with him his mother was crushed against a wall by a loaded wagon, and experienced, in consequence, a severe pain in her abdomen, which continued for a long time afterwards. She was delivered at the normal period of a boy without mark or deformity. The child grew up a sufficiently large, robust, and well-nourished lad, with a normal conformation of skull. The face, however, commenced during infancy to acquire a high degree of deformity in consequence of a gradually increasing enlargement of its left half. The enlargement was not confined simply to the soft parts of the face, but involved, also, the left half of the tongue, the left facial bones, and the teeth of the left portion of the jaws. The lad's speech was but slightly affected; his intellectual faculties were well developed. No distorted or grotesque movements of the hypertrophied muscles was observable.—*Vierteljahrsschrift f. d. Prakt. Heilk.*, No. xxv., 1868.

D. F. C.

26. *Recurrence at Regular Periods of Epidemics of Certain Diseases.*—R. FORSTER has made a series of observations in reference to this point upon the epidemics that have occurred in the city of Dresden. (*Jahrb. f. Kinderheilkunde*, N. F. 1-121). There occurred during the course of the last thirty-three years, four severe epidemics of variola, after nearly regular intervals of from seven to eight years. This periodicity was probably due in part to the fact that at the termination of the period just named there takes place in the city a re-accumulation of children not protected from the disease. The epidemics of small-pox in Dresden exhibited a gradual increase and decrease, continuing each time for from seven to twelve months. For a long period afterwards sporadic cases continued to occur. Dr. F. did not observe in the latest occurring epidemics that greater spread and intensity that is reported to have occurred elsewhere. The epidemics prevailed to the greatest extent and severity in the most crowded streets of Dresden, but from no portion of the city was the disease entirely absent. The susceptibility to the disease of unprotected children increased with their age. An increase in the number of cases of varicella did not indicate any connection of the latter with the prevailing epidemic. In instances which occurred of the occasional coincidence of the two diseases in the same family no fact occurred that would seem to prove that one of them had been communicated by the other.

Epidemics of scarlatina exhibited in their recurrence and severity a periodical vibration. A series of very severe epidemics of the disease occurred towards the

end of the last century, and continued to recur until the commencement of the present; another series, distinguished by their malignancy, occurred between the years 1823 and 1837. These severe epidemics recurred at intervals of from five to six years. The majority of the victims were children from three to six years old.

Extensive epidemics of measles recurred after intervals of some forty-one years. They exhibited, however, a less decided periodicity than those of variola, in consequence of the occasional occurrence in the intervals, of slight epidemics of the disease. The continuance of each epidemic visitation lasted about five years. Amid the thickly populated portions of the city simultaneously with measles, cases of variola and scarlatina.

In respect to the occurrence of whooping-cough epidemics no decided cycles were observed, not even to the same extent as was the case in measles.—*Centralblatt f. d. Med. Wissenschaft*, No. 17, 1868. D. F. C.

27. *The Cholera Epidemic of Prague*.—From an account given in the *Prague Journal of Practical Medicine*, vol. 1, 1868, by Drs. PRIBRAM and ROBITSCHKE, we learn that the entire number of the persons attacked amounted to 2243. The proportion of deaths among the patients treated in the General Hospital was 52.72. During the prevalence of the epidemic in the city, no change was observed in the diseases which occurred in connection with it. The number of those attacked with diarrhoea was no greater preceding the outbreak of the cholera, than in other years at the same season, nor was there observed any unusual tendency in the diseases that occurred to become complicated with an affection of the bowels. Acute diseases, whether occurring during or subsequent to the choleraic epidemic, exhibited no disposition to change in respect to either their frequency or their course; the only exception to this that was observed was in the case of typhus fever and smallpox, both of which maladies immediately after the decline of the epidemic increased in a threefold degree. The ratio of the mortality caused by the cholera, was the highest at the early period of the epidemic; with the decline of the latter it diminished, excepting when a fresh outbreak of the disease occurred, in some new locality. Neither the temperature, the moisture or dryness, the weight, or the electric condition of the atmosphere appeared to exercise any marked influence upon the course of the epidemic, neither did the amount of rain which fell. It is true, nevertheless, that during its continuance copious showers of rain fell, and that the cessation of the disease and the termination of the rainy season took place simultaneously; this, however, can be viewed in no other light than as a mere coincidence. It was further observed that for more than a month preceding the outbreak of the epidemic the tides were very low, but rose to a great height just before the cholera made its appearance. The geological formations of Prague and of the country immediately surrounding it is apparently well adapted to the attraction and propagation of cholera. Among the inhabitants of those streets that are laid out upon an alluvial soil, the basis of which is composed chiefly of a soft, friable slate, the disease prevailed to the greatest extent. Indeed few of the houses built upon a clay foundation entirely escaped the epidemic. In support of the opinion which refers the propagation of cholera from the sick to the well, through the intermedium of the discharges of the former, the following facts are adduced. 1. The epidemic did not break out simultaneously with the entrance into the city of bodies of foreign troops but only after the arrival home to their families of soldiers affected with choleraic symptoms. 2. The first case which occurred among the inhabitants was that of a washerwoman in one of the military hospitals. 3. The next cases occurred in houses where soldiers affected with cholera were quartered. 4. With the sudden increase in the number of such diseased soldiers, quartered upon the people, a similar increase took place in the number of the cholera patients. As the quartering in private houses of sick soldiers diminished, so, also, with equal promptness was the spread of the cholera arrested. 5. In the general hospital the number among the nurses who were attacked amounted to fifty per cent. Those whose duty it was to remove the dejections of the cholera patients were the most frequent victims of the disease.

6. The inhabitants of houses situated near to or along the banks of uncovered drains furnished a proportionately large number of cholera patients. In locali-

ties where either drains or sinks are present, and especially in such where it is the custom of the people to simply discharge their domestic filth in the street before their dwellings, an enormous number of cholera cases occurred. Dwellings situated near rapid streams of water, particularly those along which occur a number of mills, very generally escaped the disease.

An interesting fact is noticed in the report before us; and that is, that those streets the surface drainage of which, in consequence of their great declination, was prompt and effectual, were those in which the cholera prevailed to a greater extent than in those of a more level grade. The authors of the report simply record the foregoing facts, without any attempt to explain their etiological bearing.

D. F. C.

28. *Treatment of Delirium Tremens by the Application of the Spinal Ice-bag.*—Mr. D. B. HEWITT, in a paper read before the Medical Society of the College of Physicians of Ireland, related an interesting case of delirium tremens successfully treated by the spinal ice-bag, applied from the fourth cervical down to the upper lumbar. In a short time the patient fell asleep and slept soundly two hours. From this period the patient's recovery was complete, his appetite soon returned, and he was given a liberal diet, without any stimulant. He slept for the greater part of three days, during which the ice-bag was applied thrice daily; he always found it to strengthen him, and he said it made him feel as fresh as ever. It was discontinued on the 3d of March, owing to its giving rise to such depression of the circulation, as to produce an intermission in the pulse.

Mr. H. remarks, that in a short time after the application of the ice-bag the following phenomena were observed: 1st. The induction of sleep. 2d. The diminution, and finally the disappearance of the tremors. 3d. The regulation of vascular action. 4th. The cessation of sweating. 5th. The production of a rise in temperature all over the body with a return of the natural colour to the face.

I am quite alive to the fact that the same result may not be attainable in every case, and that further investigation is needed as to the effects, both in this and other cases of the application of ice to the spine, nor do I believe that we need necessarily adopt Dr. Chapman's explanations because we use this therapeutic agent.—*Medical Press and Circular*, April 22, 1868.

29. *Continuous Electrical Currents in the Treatment of Suspension of Vital Actions Caused by Chloroform.*—MM. ONIMUS and LEGROS, after examining the effects of constant electrical currents on the heart and its nerves were led to believe that such currents might prove efficient in stimulating the heart's action after its paralysis by chloroform inhalation. They have, accordingly, carefully investigated the subject (*Comptes Rendus*, Mars 9, 1867). They assert that in chloroform syncope there is more or less paralysis of the muscular fibres of the heart. The means hitherto recommended to treat this condition, such as artificial respiration, flagellation, and aspersion with cold water, are insufficient, as they do not directly influence the muscular action of the heart. Interrupted currents of electricity should not be used, as they diminish and even stop the respiratory and cardiac movements. The value of continuous electric currents was tested by experiments on dogs, rabbits, rats, and frogs, in the following manner. A rat was placed under a glass cover along with a sponge saturated with chloroform. Its respirations gradually became jerking, and, in one minute, they had nearly ceased, while the animal was now completely anesthetized. It was left for thirty seconds longer under the glass cover, and, after being withdrawn, it was left untouched for another thirty seconds. No cardiac action was now perceptible. A continuous electric current was then passed from the rectum to the mouth; nothing was observed for several seconds, when the heart's beats reappeared, and then imperfect respiratory movements occurred, which, by and by, became quite normal. The electrification was now stopped, and the animal gradually recovered. Even when left for two minutes in a state of apparent death, the application of a continuous current resuscitated the animal. If an interrupted current were employed in place of a continuous one, death always occurred; but if the former had been employed for only a

short time, life could still be restored by the use of a continuous current. The experiments on frogs were of great interest, as the various stages of the effects could be distinctly recognized, especially if the heart were previously exposed. As the exhibition of the anæsthetic was continued, the beats diminished in force and number and then ceased; if a continuous current were now used, the beats recommenced. A frog was left to itself for twenty-four hours after complete chloroform anæsthesia; the heart was then quite immobile, and although a continuous electric current could not cause any contractions of the voluntary muscles, it caused a renewal of the heart's action.—*Journal of Anatomy and Physiology*, May, 1868.

SURGICAL PATHOLOGY AND THERAPEUTICS, AND OPERATIVE SURGERY.

30. *Cure of Axillary Aneurism by Slight Compression*.—Dr. Beck has reported a remarkable case of a man who was affected with an aneurismal dilatation of the right axillary artery of fifteen months' duration, and whose left subclavian artery was absent, the left superior extremity being supplied by the ascending cervical, transverse scapular, and costo-cervical vessels. In consequence of this anomaly, and also of symptoms of slight aortic dilatation, Dr. Beck did not venture to tie the right subclavian, but treated the axillary aneurism by placing his patient on a low and farinaceous diet, in order to reduce the force of the circulation, and, by compressing the tumour with a broad band of caoutchouc and several turns of a bandage. The patient left the hospital at the end of ten days, but continued to wear the elastic band for two months, during which time the pulsations of the aneurism gradually ceased, the tumour became small and hard, and the fingers of the right hand became livid and wasted. A complete cure was the result.—*Brit. Med. Journal*, from *Deutsche Klinik*, No. 44, 1867.

31. *New Apparatus to Obtain Alternating and Elastic Compression of Arteries*.—Dr. CH. SARAZIN, Prof. agrégé of the Faculty of Medicine of Strasbourg, gives (*Brit. Med. Journal*, March 14, 1868) the following description of a compressor devised by him, "with which it will be easy to obtain alternating and elastic compression of all arteries accessible to indirect compression.

"Let the part of the limb which is to be submitted to compression be surrounded with a layer of wadding or a flannel roller, and then with two or three rollers stiffened with dextrine, or, still better, with silicate of potassa. Any solidifiable mixture which stiffens properly would do as well. The limb is thus inclosed, but not compressed, in an immovable apparatus exactly moulded upon it. When the bandage is stiff, the course of the artery should be delineated on its surface; and along the line thus traced, two oval traps, of the size of common compress-pads, should be cut. These pads are to be made of cork, from two to three inches thick, according to the depth which their action is intended to reach. Placed alternately on the course of the artery, and separated from the skin by the layer of wadding or the flannel, they are fixed with an India-rubber roller, of which the turns, as they are added one above the other, increase at will the compression of the artery without compressing the limb, protected as it is by the bandage. Inside the stiffened bandage may be inserted, if thought fit, the wooden wedge with which B. Anger endeavours to prevent the artery from escaping from the compressive action applied. It might as well be applied outside the bandage before it is stiffened, and when this is depressed and sufficiently hard it should be taken away.

"To judge of the comparative value of this apparatus, I shall state in a few words the conditions which a good compress must fulfil.

"1. The limb should be well secured to prevent the compressive pads from being deranged. It is evident that an apparatus enveloping completely the

limb, and moulded upon it, will be in better conditions of fixity than counter-pressure pads, or even than padded splints.

"2. The counter-pressure must bear on a large surface to avoid pain. An apparatus moulded on the limb is more likely to obtain this result than padded splints, and particularly more so than counter-pressure pads.

"3. The compression must be energetic at will, and alternating. It will be made as powerful as may be required, while it retains all its elasticity, by multiplying the turns of the India-rubber roller which passes over the pads.

"4. The compression must be continuous and alternating, to prevent the same point of the skin over the artery from bearing all the compressive effort. The compressive action is made to bear on one pad or the other at will; and even more than two pads might be used if it were thought fit.

"While all other apparatus extant require immobility of the limb, this one does not; and the surgeon is not needed to fix and tighten the pads, it being impossible for them to become placed by the side of the artery outside the traps cut out to receive them."

32. *Statistics of Amputation.*—Prof. J. F. HEYFELDER furnishes a contribution to this subject derived from twenty-two years' (1841–63) hospital practice in three different places, viz., Erlangen, Helsingfors, and St. Petersburg.

1. In the surgical clinic of Erlangen, during the years 1841–54 there were performed 127 amputations, with 101 recoveries, and 26 deaths. Of these, 55, with 35 recoveries and 20 deaths, were amputations in continuity; and 72, with 66 recoveries and 6 deaths, were amputations in contiguity or disarticulations. Of the 55 amputations, 10 related to the arm, with 4 deaths, and 25 to the leg, with 8 deaths, 4 to the forearm, with no deaths, 16 to the thigh, with 8 deaths. Of the disarticulations, the shoulder supplied 4 cases, with 2 deaths, and the hip 8 cases, with 4 deaths. The remainder were operations on the foot and hand, all terminating successfully.

2. In the Military Hospital at Helsingfors, the reporter performed during 1855–56, 39 amputations in continuity, with 14 recoveries and 25 deaths, viz., 4 of the arm, with 1 death, 4 of the forearm, with no death, 18 of the thigh, with 15 deaths, and 13 of the leg, with 9 deaths. There were also 24 disarticulations, with 12 deaths, 15 of these being amputations at the shoulder-joints, with 4 deaths, and 2 amputations at the hip-joint, both fatal.

3. In the First Military, Workmen's, and Children's Hospitals of St. Petersburg, there were performed during 1856–63, 61 amputations in continuity with 26 deaths, viz., 5 of the arm, with 2 deaths, 9 of the forearm, with no deaths, 14 of the thigh, with 10 deaths, and 23 of the leg, with 14 deaths. The disarticulations amounted to 43, with 18 deaths, among these there being 5 operations on the shoulder, with 2 deaths, 3 on the hip, and 6 on the knee, all fatal.

Viewed together, it results from these figures that 1, the issue of amputation of the forearm was highly favourable, since the whole 17 cases recovered. 2. Next comes that of the arm, 12 recovering and 7 dying of 19 cases; the mortality being 40 per cent. at Erlangen and St. Petersburg, and 25 per cent. at Helsingfors. 3. Amputations of the leg were 61 in number, with 30 recoveries and 31 deaths; the mortality being 32 per cent. at Erlangen, 69 at Helsingfors, and 64 at St. Petersburg. 4. Amputations of the thigh amounted to 48, with 15 recoveries and 33 deaths, viz., a mortality of 50 per cent. at Erlangen, 83 at Helsingfors, and 71 at St. Petersburg. 5. With respect to sex, of the 155 amputations 136 were performed on males, and 19 only on females; and the comparative mortality was at Erlangen 75 per cent. for the males, and 25 per cent. for the females. At Helsingfors they were all males, and the two females at St. Petersburg both recovered. 6. The amputations were performed at Erlangen for traumatic causes in 14 cases, and for chronic organic disease in 41. The former ended fatally in 6 cases, or 42 per cent., and the latter in 14 cases, or 34 per cent. At the Helsingfors Military Hospital, 30 of the 39 amputations were performed for injuries, with a mortality of 25, or 64 per cent. At St. Petersburg, 30 of the 61 amputations were for injuries, with 26 deaths, or 86 per cent. The 25 amputations for disease all terminated well. 7. The ages of the patients are not specified, the reporter only mentioning that the

young under 15 generally recover, while it is quite exceptional for a patient above 70 to do so. 8. The disarticulation of the shoulder-joint proved fatal at Erlangen in 50 per cent., at Helsingfors in 80 per cent., and at St. Petersburg in 40 per cent. That of the hip-joint did so in 4 out of the 8 cases at Erlangen, and in the 5 cases at the other hospitals, one of these, however, perishing from the cholera. The 7 cases of disarticulation of the knee all proved fatal. Of the 9 operations on the joints of the hand only 1 proved fatal; and of 20 tibio-tarsal operations all but 2 did well. Operations on the fingers and toes were nearly all successful.

To this statement Dr. Heyfelder adds another statistical abstract, derived, from cases observed (in private practice, we presume) in Finland and at St. Petersburg, during the years 1855-62. From this it appears that 234 amputations furnished 151 recoveries and 83 deaths, the mortality prevailing in the following proportions: amputation of the arm, 33.3 per cent.; forearm, *nil*; thigh, 77.3; leg, 53.2; shoulder-joint, 66.5; hip and knee, 100; the hand, 9.1; and tibio-tarsal, 25.1.—*Med.-Chir. Rev.*, April, 1868, from *Berliner Klinische Wochenschrift*, September, 23.

33. *Results of Ovariectomy*.—On the completion of 100 cases of ovariectomy in the Samaritan Hospital, Mr. SPENCER WELLS gave a short account of the progress of the operation in London Hospitals. When he performed his first operation in February, 1858, ovariectomy had only once been performed successfully in any of the large hospitals of the Metropolis, and that solitary case was in 1846, or twelve years before. For twelve years—or from 1846 to 1858—there had not been a single successful case of ovariectomy in any of the large hospitals of London; yet in less than ten years after 1858, he (Mr. Wells) had himself, in this small hospital, completed 100 cases, with a result of seventy recoveries and thirty deaths—a result which ten years ago would have been regarded as incredible, but which the experience of the past teaches us will become still more encouraging in the future.

After performing the first operation in the hospital this year, Mr. Wells again recurred to this subject, and exhibited the following table of his hospital cases, from the first in 1858 till the last in 1867:—

Year.	Cases.	Recoveries.	Deaths.	Year.	Cases.	Recoveries.	Deaths.
1858 . . .	3	3	0	1864 . . .	13	10	3
1859 . . .	7	4	3	1865 . . .	14	11	3
1860 . . .	2	1	1	1866 . . .	11	6	5
1861 . . .	6	3	3	1867 . . .	21	17	4
1862 . . .	13	10	3				
1863 . . .	16	11	5		106	76	30

He said this table proved that a much greater success has been attained in 1867 than in any preceding year; and if the cases are divided into two nearly equal series, by comparing the 47 cases up to 1863 with the 59 cases since, it will be seen that there were 15 deaths in each series—15 deaths and 32 recoveries in the 47 cases, 15 deaths and 44 recoveries in the 59 cases.

In reply to a question, last Wednesday, on the comparative success of ovariectomy in hospital and private practice, Mr. Wells said the experience of the Samaritan Hospital proves that it is possible to obtain as good, or nearly as good, results in a small hospital as in a private house; for his own success in hospital and in private practice has been almost the same. He has completed the operation in 250 cases, with a result of 180 recoveries and 70 deaths—a mortality of exactly 28 per cent. But the results of the later cases have been much more favourable, for of the last 50 cases only 8 have died and 42 have recovered—a mortality of only 16 per cent. He believes that even this mortality will be still further reduced.—*Med. Times and Gaz.*, February 22, 1868.

34. *Non-Uniting Fractures*.—Mr. GEO. W. CALLENDER read a paper (March 24, 1868) on this subject before the Royal Med. and Chirurg. Soc. After referring to the statements made by Amesbury and Hamilton respecting non-uniting fractures, the author relates a series of cases to show that the union of

a broken bone is never prevented, although it may be delayed, by constitutional causes. Instances are given of the repair of fractures in cases of recent and long-standing paralysis, and cases of non-union occurring during childhood are incidentally referred to. The results of the treatment of fractures at St. Bartholomew's Hospital during the past seven years are mentioned; also the history of a case of non-uniting fracture of the thigh, and cases of non-union from special local causes. It is concluded that three well-defined varieties must be enumerated of fractures which fail to unite: 1. Fractures, not inaptly termed spontaneous, which ensue from diseases of bone; in which it is evident that no union is likely to take place. 2. Fractures (a) with separation of the bone and periosteum to such an extent that there cannot be thrown out bone-material enough to fill up the gap between the fragments; (b) occurring through bones not provided with periosteum, when it is difficult to keep the broken ends together. 3. All fractures other than the preceding; and in these cases, although union may be delayed, it never ultimately fails, except as the result of bad management of the injury. Several cases are narrated to show the effect of non-uniting fracture upon joint movements, and the treatment of those injuries where the thigh is the bone involved is briefly referred to. Cases are cited in illustration of the great length of time after the lapse of which a fracture, if properly treated, may be repaired, and the occasional good results from mere fibrous union are illustrated by pathological observations. The question of joint-stiffness after fractures is considered, and the importance of not interfering with such stiffness until the fracture is firmly united is insisted upon, and reasons are given for the presumption that such premature interference by the use of passive movements is a frequent cause of non-union. The following are the conclusions arrived at: Non-union of an ordinary fracture should never occur. Under careful treatment, bones will unite two years or longer after the occurrence of the fracture. It is reasonable to suppose that such fractures would have united at an earlier period, if properly treated. Treatment of delayed union should consist—1st. In the improvement of the health, and in the avoidance of local obstructions to the circulation. 2d. In placing the broken bone in the best position attainable. 3d. In leaving it at rest until it unites, its doing so being simply a question of time. 4th. In avoiding all attempts to overcome the stiffness of joints adjacent to, but not involved in, a fracture, until the bone is firmly united; and this applies also to the management of fractures which unite in the usual time.—*Med. Times and Gaz.*, April 11, 1868.

35. *Dislocation of the Thigh into the Ischiatic Notch; Reduction by Manipulation.*—Mr. G. W. CALLENDER records (*Lancet*, March 14, 1868) a case of this in a robust labourer, æt. 35. A surgeon in the neighbourhood attempted to reduce the dislocation without success, and the next morning he was sent to St. Bartholomew's Hospital. In the afternoon the patient was put under the influence of chloroform, and Mr. C. attempted reduction but failed; and the following day another effort was made by manipulation, and also by extension by pulleys without success. Vexed by his failures, Mr. C. studied more carefully the causes of his failures, and after allowing the patient to rest for several days he adopted the following plan: "The thigh was bent upon the abdomen, and I slowly moved the limb into a straight line with the body, so that the head of the bone could be felt projecting in the buttock, outside the tuber ischii. The limb, in a straight line with the trunk, without allowing any rotation outwards, was then drawn forward from the abdomen, and forced downwards (extended), and the head of the bone at once slipped into the acetabulum. These movements were made slowly and steadily, and the limb was extended with care, remembering the great leverage which we were making use of, and the position of the head, which was being pressed up into the socket. In two recorded cases the neck of the femur has been broken under a somewhat similar strain.

"If these manœuvres are examined by the help of the skeleton, it will be found that by flexion, and by moving the thigh into a straight line with the body, the head is brought from the notch into the groove just above the outer side of the tuber ischii. Here it is opposite the least prominent part of the lower edge of the acetabulum, and if the femur is depressed whilst in this position the head

easily slips into the socket. Dr. Markoe,¹ with the addition of a rocking movement as the thigh is extended, and Dr. Hamilton, employ somewhat similar manœuvres, and they speak favourably of their success.

"I have been anxious to give some explanation of the manner in which the method by manipulation acts, and to insist upon the importance of not abducting or rolling the limb outwards, for if this is done, the head of the bone is almost certain to roll past the acetabulum to its inner side; or if an obturator dislocation is under treatment, and the thigh is rotated inwards, the head of the femur will, as I have several times seen it, roll round on to the ischiatic notch, just reversing the movement which takes place when an ischiatic dislocation is improperly manipulated.

"Three steps complete the operation. First, the thigh is bent on the abdomen; secondly, it is brought into a straight line with the long axis of the body; thirdly, it is forced down (or extended) in a straight line, parallel with its fellow. The dislocation is thus reduced without difficulty and without the need of any assistant. And, what is of chief importance, the operation avoids all risk of rolling the head of the bone round the acetabulum, an accident which is so apt to complicate manipulation as commonly practised."

36. *Dislocation of Tendons*.—M. JARJAVAY observes that, while it is obvious that in severe injuries of joints the displacement of tendons forms but one of the details of the general lesion, the question of whether these admit of displacement without coexisting fracture of the bones or dislocation of the joints is not so easily determined; most authors, however, answering it in the negative. A portion of the subject he has had opportunities of studying, and now presents the results.

1. *Displacement of the Long Tendon of the Biceps*.—After a critical examination of the supposed examples of this occurrence which have been published, and relating five analogous cases which have come under his own notice, he arrives at the following conclusions: 1. The simple dislocation of the long tendon of the biceps has no existence, or at all events this has never been demonstrated. 2. That the lesion which has been mistaken for it is situated in the sub-acromial serous bursa. 3. This lesion consists in inflammatory swelling, caused by the contusion or rupture of the bursa; or, as a consequence of the inflammation, in hypertrophy with induration of its parietes, and a fibrous transformation of the cellular lamellæ which traverse it. 4. The following are the symptoms observed: A sensation of displacement at the time of the accident; tumefaction of the point of the shoulder; pain which prevents the movements of the arm, especially abduction; flexure of the forearm on the arm, with consequent rigidity of the biceps, and a sense of fatigue at the bend of the elbow; increase of pain, and a noise beneath the acromion when the limb is raised in a state of abduction—that is when the tuberosity of the humerus is caused to slide beneath this apophysis (this noise, a kind of cracking, gives the idea of the reduction of something displaced, and is reproduced every time the bone is rotated while held in a horizontal position); a disappearance of the pain, and return of the movements of the part after rest, placing the forearm in a sling, and the application of resolvent lotions to the shoulder, the noise persisting even after the pain has disappeared and the movements of the part have again returned. 5. The application of electricity to the attachments of the deltoid and supra-spinatus muscles is an excellent means of immobilizing the scapula, while the arm is at the same time exercised.

2. *Dislocation of the Tendons of the Peronei Muscles*.—Of the reality of this lesion M. Jarjavay has no doubt, not only on account of cases which have been recorded by others, but also because of two well marked examples he has met with himself, the particulars of which he gives. Still it is a very rare accident, for he cannot agree with M. Demarquay that so obvious a lesion could have been often overlooked by competent surgeons. In two of the recorded cases the tendons of both the peronei were displaced, but in the others only that of one, which M. Jarjavay believes must have always been that of the longus. In

¹ New York Journal of Medicine, 1855.

almost all the cases the weight of the body in falling has borne upon one foot, the extremity of this being turned inwards. In such a case a fracture of the malleolus or a bad sprain from distension or rupture of the ligaments often results; but in other cases, when the groove of the malleolus is not very deep, a rupture of the sheath occurs and the tendons are luxated. Of eighty persons examined by M. Jarjavay, he found that in four the posterior edge of the malleolus only incompletely contained the tendon of the peroneus longus when he induced forcible contraction of the muscle. This would then act as a predisposing cause, the efficient one consisting in the energetic contraction of the muscles when, on a fall upon the anterior extremity of the foot turned inwards, an effort is made to replace it. The symptoms much resemble those of a severe sprain, the patients often being able to walk somewhat after the accident. There is swelling with or without ecchymosis, and in the midst of the infiltrated tissue the tendon is felt rolling under the finger. It is easily replaced by pushing it from before backwards, the displacement being reproduced at will by causing the peronei to contract, while the anterior extremity of the foot is fixed and directed inwards. In some cases it is displaced spontaneously with the greatest ease. With an appropriate starch bandage applied, after the swelling has subsided, the cure is generally completed by about the thirtieth day.—*Brit. and For. Med.-Chir. Rev.*, April, 1868, from *Gaz. Hebdomad.* Nos. 21, 23, 25; 1867.

37. *Dr. Richardson's Styptic Colloid as a Dressing for Wounds, Sores, etc.*—In our No. for April last, we quoted the testimony of Dr. Lowe as to the utility of this application. Mr. WILLIAM ADAMS testifies (*Med. Times and Gazette*, March 14, 1868) even more strongly to its advantages. It fulfils, he says, the combined indications of the antiseptic and subcutaneous principles in a higher degree than any other application hitherto employed.

The process of manufacture of the fluid, Dr. R. states, "is tedious but sufficiently easy. The object to be aimed at is to saturate ether entirely with tannin, and a colloidal substance, xyloidine, or gun-cotton. In the first step of the process, the tannin, rendered as pure as it can be, is treated with absolute alcohol, and is made to digest in the alcohol for several days. Then the ether, also absolute, is added until the whole of the thick alcoholic mixture is rendered quite fluid. Next the colloidal substance is put in until it ceases readily to dissolve. For the sake of its agreeable odour, a little tincture of benzoin is finally admixed. . . .

"When the solution is brought into contact with an open surface of the body, the resultant phenomena are these: The heat of the body gradually volatilizes the ether and the alcohol, and the tannin and cotton, as the ether leaves them, are thus left stranded on the surface in intimate combination. In proportion as the ether passes off, the blood or the secretion of the surface permeates the tannin and cotton; but tannin acts directly upon albumen, coagulating it, and transforming it into a kind of membrane, almost like leather. The cotton meanwhile unites the whole, gives substance to the mass, and adhesive quality. When all is solidified, the dressing becomes, in fact, a concrete, having a true organic hold or basis on the tissues; and as the tannin, if the solution be freely applied, is in excess, any new exudative matter or blood is for several hours taken up by it, and the annealing is made the more complete.

"Thus, by this dressing, the air is excluded from every possible point in every possible direction, not by a mere septum, but by the combination of the animal fluids with the remedy; and because the air is excluded and fluid is absorbed, there is no decomposition—i. e., no oxidation; and, because there is no oxidation, there is no irritation. . . .

"In cases of compound fracture, after the parts have been brought into apposition as far as is possible and fixed in the necessary position, the fluid should be poured slowly into the open cavity so as to fill it. Then the parts, externally, should be covered with a layer of cotton-wool saturated with the solution.

"On open cancer, and on suppurating or decomposing surfaces, the solution may be freely applied with the brush, and afterwards, the parts may be covered with cotton-wool saturated with the fluid.

"In no case need there be any fear that irritation will follow the application

of the solution. On the contrary, the action of it is so purely negative that it might be considered a sedative. It is not such in the technical sense of the term, but it so effectually covers the wounded and susceptible surfaces as to maintain what is virtually a sedative influence."

Mr. Adams says that he has now for more than a year used this styptic colloid "in a large number of cases of incised and lacerated wounds, some of formidable dimensions, with complete success in a large proportion of cases. In two-thirds of the cases so treated, I can with confidence assert that union by the first intention has been obtained; or that the reparative process has proceeded either without suppuration, even in bad cases, or with the suppurative process reduced to a very insignificant amount, and in no instance have I seen any injurious effects. In about one-third or one-fourth of the cases, the styptic had to be abandoned in consequence of suppuration occurring, and antiseptic lotion relied upon.

"The largest operation in which I have applied it—or rather I should say that in this case Dr. Richardson himself was kind enough to apply it—was amputation of the foot, by Chopart's operation, in a young gentleman, aged 19 years, for extreme deformity of the foot, with ankylosis, after suppurative inflammation which had attacked the left foot, and also the right knee-joint, in consequence of purulent absorption; and I should mention that he was supposed to be particularly prone to erysipelas.

"In alluding to this case Dr. Richardson observes: 'The operation was performed on Wednesday, February 13 of this year (1867), and as the cuboid bone and os calcis were ankylosed, the saw had to be freely used. Several vessels had to be tied, and the ligatures were left in the usual way suspended from the wound. When the lips of the wound had been brought together by wire sutures, I coated the wound freely with the fluid, and the bandage was applied. Three days later there was no fetor, no discharge, and no general symptoms, but as Mr. Adams was anxious to see the condition of the wound, I undressed it. To our delight we found it healed throughout, but, unfortunately, from the bandage adhering to one of the long ligatures, I, in removing it there, tore open the newly-healed wound for the space of a quarter inch. At this broken spot about a teaspoonful of purulent matter formed two days later; but this little break was very quickly reunited, and on the sixteenth day after the operation the patient was able to return to the country with complete healing by the first intention, and without having suffered from one symptom of a constitutional kind.'

"Another case was that of compound dislocation with fracture of the second phalanx of a finger, produced by a cricket ball at Lord's ground. The patient, Captain McN., came to me immediately after the accident, and after reducing the dislocation and applying three metal sutures I applied the colloid styptic and bandaged the finger to a straight splint. On the fourth day, finding no indication of inflammation, I allowed the dressing to remain, and did not remove it till six weeks after the accident, when I found the wound not only well cicatrized, but the callus was less than I expected, and some motion existed at the joint, which subsequently became quite free.

"Another case was one of enchondromatous tumour, growing from the interior of the first phalanx of the third finger of the left hand of a young gentleman, Master K., upon whom I operated on April 3, 1867. My colleague, Mr. Gay, assisted me in the operation, and held the extensor tendon on one side, whilst I gouged out the growth from the interior of the bone, extending as closely as possible to the articulations at either extremity. I applied the colloid styptic to the interior of the bone, and, after applying metal sutures, painted the wound over with the styptic, and applied a little cotton-wool saturated with it as a dressing. No suppuration occurred, and the wound healed completely under the first dressing, the boy recovering motion at both the articulations. Nothing could be more satisfactory.

"Under my direction a large number of incised and lacerated wounds, including many of considerable size and many scalp wounds, have been treated by the application of styptic colloid at the Great Northern Hospital, by Mr. P. Hopgood, the House-Surgeon. The wounds were generally washed with ether instead

of water, or with ether after water had been applied. I have before me the details of thirty-three of these cases, supplied by Mr. Hopgood, but will only read you in a few words the conclusions to which he has arrived. Mr. Hopgood observes: 'Out of the thirty-three cases of recent wounds treated with the styptic colloid, twenty healed by the first intention, requiring no further application than the first dressing; the remaining thirteen required the styptic to be removed, but still in nearly all some amount of adhesion had taken place, although suppuration had taken place in all, requiring the removal of the dressings. The styptic colloid, in my opinion, has these advantages: It is certainly a great improvement on the "pad and bandage" usually used in cases particularly in scalp wounds, and without doubt favours greatly, although not certainly, adhesion by the first intention, adjusting by its contractile powers (upon drying) the surfaces of wounds together, and effectually preventing the access of air. It appears to me, from the wounds I have treated with it, to be particularly applicable to clean-cut wounds where the surfaces can be brought accurately together; but the styptic is certainly often successful in obtaining union without suppuration in lacerated and often contused wounds, checking at all times, and often preventing suppuration in a wound which otherwise treated would be nearly sure to suppurate.'

"The testimony I have now given in favour of Dr. Richardson's colloid styptic as a material for the dressing of wounds, calculated to promote healing by the first intention or without suppuration, superseding the use of plasters, and embodying in the most scientific manner the antiseptic and subcutaneous principles, will, I hope, induce other surgeons to give this method a more extended trial. It is, I believe, only by such a combination of the antiseptic and subcutaneous principles that we can hope to prevent the more serious results of injuries with open wounds, such as exhaustive suppuration, diffuse inflammation, pyæmia, and death."

38. *Sterility in the Male Cured by an Operation for Phimosis.*—M. A. AMUSSAT, JR., remarks that it can readily be understood that extreme phimosis may constitute a mechanical obstacle to the regular propulsion of the sperm, and thus be a cause of sterility in the male; and he records a case of sterility cured by removing a phimosis. The subject of it was a gentleman who had been married for five years without his wife becoming pregnant, which caused uneasiness in the family. On examination his physician ascertained that he had a very contracted phimosis with excessive length of prepuce, so that the gland could not be uncovered; and when he urinated, the præputial sac became filled like a funnel from which the urine afterwards flowed in a very thin stream. M. A. removed the prepuce by circular cauterization¹ on the 11th of May. The part separated on the 25th, and in July the cicatrization was complete, and the remaining prepuce could be drawn back so as to uncover the gland, and urination became free. One year afterwards, the gentleman's wife gave birth to a son.—*Journ. de Méd. et Chir. Prat.*, 1866.

39. *Threatening Gangrene Successfully Treated by Cold Affusion.*—Professor SCHUTZENBERGER, instead of the common treatment by warmth (which he considers irrational, inasmuch as heat paralyzes and dilates the bloodvessels, thus favouring the stagnation of the blood in them, the formation of phlyctenæ and the mortification of the tissues) recommends cold, and has treated by this means a case of threatening gangrene of the hand and of the inferior third of the forearm from thrombosis of the brachial artery. Based upon the fact that cold determines the contraction of the vascular coats, he has successfully employed cold affusions every half hour combined with centripetal shampooing, and the patient was cured.—(*Gaz. Méd. de Strasb.*) *Dict. Annuel des Progrès des Sci. et Instit. Méd.*, 1867.

40. *Continuous Irrigation of the Ear in Otorrhœa.*—Dr. PRAT considers that the membrana tympani allows of osmotic dialysis, and can be penetrated

¹ Circumcision with the knife, it seems to us, would have been more speedy, less painful, and equally effectual.—Ed.

by liquids or gases. Ten or even twenty quarts of warm water, in a continuous current may be passed into the ear with advantage. He has had constructed for this purpose an instrument, consisting of two India-rubber tubes passing into a short cylinder suited for insertion into the external meatus, in which cylinder there is a partition to divide the current. Each of the gum-elastic tubes is connected with one of these partitions, so that when warm water is injected through one of the tubes it passes to the tympanum and returns by the other, thus establishing a continuous current. He asserts that the best results have been obtained by this means.

41. *Hypertrophy and Atrophy of the Prostate*.—Prof. DITTEL, of Vienna, from *post-mortem* examinations of the prostate in 115 individuals, the youngest of whom was 52 and the oldest 100 years of age, found hypertrophy of this gland in 18 instances, and atrophy in 36. The proportion is thus about 15 cases of hypertrophy to 30 cases of atrophy, a result very different from that derived from the investigations of Sir Henry Thompson, who found that the cases of hypertrophy, compared numerically with those of atrophy, were as 22 to 5. In one case only, out of 18, of the enlarged prostate, had the patient been troubled during life by impeded micturition. From a consideration of the fact, that extensive hypertrophy of the prostate gland may exist without causing retention of urine, which is usually the first symptom of the disease, Professor Dittel is inclined to think that true hypertrophy of the organ may not be exclusively a senile affection, and that it may commence in individuals under 50 years of age. —*Brit. Med. Journal*, March 14, 1868, from *Medizinische Jahrbücher*, bd. xiv, 1867.

OPHTHALMOLOGY.

42. *Sympathetic Ophthalmia*.—Dr. E. MEYER observes that on surveying the numerous instances of this affection that have been published, it is found that more than one-half of them have been observed in cases in which the injured eye contained a foreign body. Of the other half, two-thirds are cases of penetrating wounds, and one-third simple contusions. Generally the lesion involves the iris and ciliary region, inducing prolonged inflammation of the injured organ. It is comparatively rare to find this sympathetic affection succeeding an operation. It is seldom met with in children, and its subjects are usually persons of a feeble, anæmic, or nervous constitution.

Of the two hypotheses which have been advanced to explain the pathogenic action excited by the injured eye upon the sound one, M. Meyer believes that while the optic nerve and its decussation may, in some instances, be the channel of transmission, this is, in a far greater number, to be sought for in the ciliary nerves. The affection by no means presents the same serious symptoms, and the same pathological changes in all cases, and may especially exhibit itself in three forms. 1. The most dangerous of these is that known as *malignant iritis* or *irido-cyclitis*, which, coming on days, weeks, or even months after the injury, leads to the deposition and organization of false membranes behind the iris, uniting it in a very solid manner to the capsule, and producing complete immobility of the pupil. There is excessive sensibility in the region of the ciliary body, and eventually the globe softens, complete blindness ensuing. Treatment can here do little. Enucleation of the injured eye after the irido-cyclitis is developed is of no avail, and its only chance of success is its employment before any sign of inflammation is present. Iridectomy is of difficult execution and doubtful benefit.

2. Ordinary *serous iritis* is the second form observed, the pupil continuing to dilate, though perhaps somewhat irregular from slight adhesions. The aqueous humour is turbid, and the globe is rather tense. Although this form is very obstinate it does not lead to irido-cyclitis. The vitreous humour gene-

rally remains intact; and in these cases enucleation, being attended with complete success, should never be neglected.

3. The slightest form of the affection may be appropriately termed a *sympathetic neurosis*. It is characterized by considerable photophobia with consecutive spasm of the orbicularis, slight injection around the cornea, weeping, a want of energy in vision, and defective power of accommodation. Enucleation would here be also a remedy; but the author, acting on the suggestion of Von Graefe, has, in three instances which have come under his notice, resorted with complete success to the section of the ciliary nerves; and he recommends that this operation should be performed when, from the sensibility of the ciliary region to the touch, sympathetic ophthalmia is to be apprehended; practising it indeed before any symptom of the sympathetic affection has appeared.—*Brit. and For. Med.-Chir. Rev.*, April, 1868, from *Annales d'Oculistique*, Sept. 1867.

43. *Von Graefe's New Modified Linear Extraction*.—From a careful consideration of the advantages and disadvantages attending the scoop extraction of cataracts, as first recommended by Waldauf and subsequently modified by Bowman and Critchett, Professor VON GRAEFE was led to devise a method of operating which would preserve all the benefit of iridectomy and a linear incision, and avoid, as far as possible, the evils that accrue from the necessity of introducing instruments into the eye to assist the evolution of the lens.

The result of his deliberations was the introduction of this new operation.

The instruments required are—

1st. A long, narrow knife, not unlike a fine tenotomy knife. The blade should be rather above an inch in length, and not exceed one-tenth of an inch in breadth. To give firmness to the blade, the surfaces should be pretty convex. 2d. An ordinary cystitome, to lacerate the capsule. 3d. A pair of iris forceps. 4th. A pair of curved scissors. 5th. A blunt hook, with its stem bent at an obtuse angle at about a quarter of an inch from its extremity; this bending of the stem is to facilitate the introduction of the hook through an incision at the upper part of the eye. 6th. A pair of toothed forceps. 7th. A wire speculum.

The patient being placed on a couch, and the lids fixed by means of the speculum, the surgeon pinches up a fold of conjunctiva close to the inferior margin of the cornea, with the toothed forceps, and draws the eyeballs downwards, and proceeds to the

First stage of the operation—the incision. The narrow knife, with its cutting edge upwards, should be introduced through the junction of the sclerotic and cornea at a point half a line from the margin of the cornea, and as much below the tangent of its vertex. The point of the knife should first be directed downwards and inwards until it reaches the centre of the pupil, the handle is then to be depressed and the point directed upwards and inwards to a spot in the corneo-sclerotic junction corresponding to the point of entrance, where counter-puncture is to be made. As soon as the point of the knife has penetrated, the edge of the blade should be directed forwards, and the incision completed by cutting straight out with a slight sawing motion.

A portion of conjunctiva is the last tissue to be divided, and forms a flap, which covers the site of the incision in the corneo-sclerotic junction.

The second stage of the operation consists in the excision of a portion of iris. Generally a portion of iris prolapses as soon as the incision is completed, which is to be seized with a pair of iris forceps and excised with the scissors, care being taken that the conjunctival flap is not cut away, and that no portion of iris is left between the lips of the wound. When the iris does not prolapse through the wound, the forceps must be introduced, a portion of iris drawn out and excised.

The third stage of the operation is the laceration of the capsule, which is effected as in the ordinary flap extraction. The laceration should be very free, and extend to the periphery of the lens, especially above.

The fourth stage—the evacuation of the lens. This is to be accomplished by drawing the eye freely downwards with the forceps, and applying the back of the curette with gentle pressure to the sclerotic margin of the incision, so as to make the wound gape. To assist the evacuation of the lens, gentle counter-

pressure may be made with the forceps below; while the curette should be made to glide along the sclerotic margin of the incision with gradually increasing pressure ("slide manœuvre"). As the nucleus of the lens presents itself at the incision the pressure is to be relaxed, and the evacuation may be completed by applying the curette to the edge of the nucleus. If, however, the nucleus is of such size as not to pass through the incision without having recourse to a dangerous amount of pressure, its evolution must be assisted by traction with the blunt hook, which is to be inserted through the incision, passed along the posterior surface of the lens, and its extremity hooked below the lower edge of the nucleus.

Prof. Von G. in a subsequent supplementary note states that he *now* effects the evolution of the lens by pressure exerted in a manner essentially the same as in ordinary flap extraction. He applies a spoon to the lower half of the cornea and exerts a gentle pressure in the direction of the centre of the eye, followed by short pushing movements from below upwards. He does not object to the slide manœuvre being employed in the first instance to secure the presentation of the margin of the lens, but considers that after this is effected the slide manœuvre contributes merely to increase the intra-ocular pressure without having any special bearing upon the line of emergence of the cataract.

The *fifth stage of the operation* consists in the clearing of the pupil from any fragments of lens that may remain by friction exerted through the lids, in clearing the lips of the wound from any intervening iris tissue or blood-clot, and in adjusting the conjunctival flap.

The after-treatment is simple; the hollows of the orbit are to be filled with cotton-wool, and an elastic bandage applied, which may be changed twice a day. Rest is recommended, but is not so imperatively necessary as after flap extraction. The patient may even get up the second day after the operation. No change of diet is necessary, beyond the avoidance of stimulants and such articles as require mastication. From the second day atropia is to be applied twice daily, to prevent adhesion between the cut extremities of the iris and the capsule of the lens; this application, however, is deferred where there is copious conjunctival secretion.

Prolapse of vitreous is the chief evil to be feared in the performance of the operation; and Von Graefe is of opinion that though too peripheral an incision, too great pressure exerted to effect the evolution of the lens, etc., may have partly caused the prolapse of vitreous, still that strong muscular straining contractions on the part of the patient are the chief factor in the production of this complication. Anæsthesia, of course, may thoroughly neutralize muscular action, but Von Graefe has some difficulty in having general recourse to chloroform, from a certain amount of danger to life that attends the induction of complete narcotism.

The advantages claimed by Von Graefe for this operation are, 1st. That the incision is linear, as the consequence of which the coaptation of the edges of wound is more perfect than is the case after a flap incision, and there is less risk of gaping of the wound, permitting loss of vitreous, *after* the performance of the operation; 2d. That it is peripheral, passing chiefly through a vascular texture in which the healing process occurs more rapidly than in a non-vascular tissue; 3d. That the incision may be viewed as subconjunctival, being covered by a flap of conjunctiva; 4th. That a portion of iris is removed, and thus no prolapse of iris can occur, and the tendency to iritic inflammation is diminished; 5th. That in most cases no instrument is introduced to assist the evolution of the lens, and, when such is necessary, a hook merely is employed; and 6th. That the after-treatment is of short duration.

Prof. Von G. claims to have operated by this method within one year upon three hundred cases, with a perfect result by one operation on ninety per cent. These cases included cataracts of various forms without selection, some immature and some complicated with conjunctivitis, granular lids, affections of lachrymal passages, staphyloma posticum, chronic iritis, etc.—*Edinburgh Medical Journ.*, Sept. 1868, from *Archiv für Ophthalmologie*, xi. band, 3 abth, 1865, and xii. band, 1 abth, 1866.

[We must observe, with due respect to the high authority of Prof. Von G.

that we cannot conceive of any circumstances which would justify an operation for cataract in patients suffering from conjunctivitis, granular lids, or chronic iritis.—EDITOR.]

MIDWIFERY.

44. *Case of Twins at different Stages of Development expelled at the same time.*—Dr. ARCHISON communicated to the Obstetrical Society of Edinburgh a case of this which he supposed to be an instance of superfœtation. The subject of the case was a well-formed woman aged 30, who had been born and brought up in India, had borne two children at full period of gestation; and then followed two miscarriages; lately been suffering a good deal from fever; her general health not good at present; system much relaxed from debility, caused chiefly by the prevalent great heat of the season. On examination, I found that after a short and easy labour the child was born, and the placenta discharged. The uterus was fairly contracted. On examining the child, found it to be a case of premature birth at the seventh month, which corresponded with the mother's statements. The child did not survive over a few hours.

I then examined the placenta, to which, much to my astonishment, was attached a large sac. This, on closer inspection, proved to be another set of membranes in an entire state, containing another fœtus. The placenta of this last being incorporated into that of the first-born fœtus, much smaller, but with a distinct mark of union still existing. At one point the membranes of both the fœti were inseparably united, and those of the smaller fœtus were much more dense in structure, and less transparent than those of the larger fœtus.

The fœtus contained in the sac (which was not opened) seemed from its size and development to have completed nearly its fourth month of utero-gestation.

On cross-questioning the mother a few days after, relative to what she considered as having been the cause of having produced the premature labour, she stated that for about ten days before the birth of the child, she had been suffering from motions resembling those of the child in utero, but higher up in her abdomen, and which were accompanied by pain, and, at the same time, that these movements caused the movements of the (first) child to come on with violence. That position relieved her, and only upon first lying down did they come on; that gradually the motion in the upper part of the abdomen got worse, and to the combined motion and pain she attributed the miscarriage. It must be here remembered that, up to this time (1868), the mother does not know of the second fœtus.

Therefore I would beg to ask the opinion of the Society whether they would consider the *quickenings* of the second fœtus to have been the cause of this premature labour, taking into consideration the relaxed condition and general unhealthy state of the mother, the advanced state of the fœtus first expelled, and the apparent previous liability of the mother to premature confinement.

Supposing the case to have been one of twins, where one fœtus was less developed than the other, might not the want of room for further development have created an excess of motion in the smaller child, and again thus have led to a like result, viz., premature labour. But I myself consider the case to have been one where one ovum was impregnated previous to the other, and therefore of true superfœtation.

Dr. WILSON was inclined to think that the case just related was one of twins, in which one of the children had died, and not a case of superfœtation. He thought that the account of the second fœtus was defective.

Dr. KEILLER took the same view of the case. Many cases of a similar kind had been recorded. It often happened that one child died in utero, and was retained, while the other went on to the full time. When the liquor amnii is retained, the dead child may be kept in perfect preservation for a very long time. He had a number of preparations illustrative of blighted twin cases in his museum.

The blighted fœtus usually presents a wizened or squashed appearance. He remembered a case which occurred in the Maternity Hospital, where the blighted fœtus was not discovered for a day or two after the delivery of the other child. On examining the placenta, a small clotted mass was observed attached, and, on raising the membranes, the blighted twin was found. Most of the so-called cases of superfœtation were of this nature. In true superfœtation, both children are at the full time, and the one is expelled a long time before the other. Such cases are very rare, but they may occur. Dr. Matthews Duncan, in his paper on the subject, shows that the spermatozoa may reach the ovule for three months after impregnation has taken place. The decidua does not obstruct the passage of spermatozoa in the early months. The old notion was that the mucous plug prevented their passage. Another explanation of superfœtation is the existence of a double uterus. The chief difficulty in the matter, however, is that during pregnancy there are no ovules to impregnate. Scanzoni at one time held that ovulation went on after impregnation had taken place, but he has now changed his opinion.

Dr. CUTHBERT had met with a case similar to that related by Dr. Atchison, in which one of the children had died and the other was born healthy. The dead fœtus was withered and shrivelled.

45. *Triples.*—Mr. TURTON reports (*Brit. Med. Journ.*, May 2, 1868) a curious case of this. The subject of it was thirty-six years of age. She had had a child fourteen years ago, and had not subsequently been pregnant until the present time. February 18, 1868, at 2 A. M., was delivered of a living male child, after having been ten hours in labour. The placenta came away in due course, and the mother was comfortable. When her husband came home to his dinner, about twelve hours after the birth of the child, he found that, during the temporary absence of her attendants, she had just given birth to two lively girls. Mr. T. was sent for, and on his arrival, found that the placenta had been expelled; one five or ten minutes after the other. Although the first after-birth followed soon after the first born child, and there was the long interval between that and the birth of the others, the patient had comparatively little hemorrhage, and has made an excellent recovery.

46. *Placenta Retained One Hundred and Twenty-Three Days after Miscarriage.*—Dr. F. W. P. JAGO records (*Med. Times and Gaz.*, April 18, 1868) a case of this in a woman aged 40, who miscarried Dec. 3, 1867, of a three months' fœtus. There was no flooding at the time, and no medical man was called. Up to April 3, 1868, she suffered from more or less bleeding, sometimes pale and thin, at others very red, and occasionally she passed small dark clots. No after-birth had passed, and she says that during the whole time the discharge was not very offensive. April 2, Dr. J., who had been called, examined her and found a globular mass presenting at the os uteri, which was dilated to the size of a florin. There was a thin discharge with small coagula, but no fœtus. I could not grasp the substance presenting, but managed to rotate it in the uterus with my forefinger. Ordered powder of ergot in fifteen-grain doses every four hours. Called on the following day, and on examination found no advance of the retained mass. She then had pains and bearing down, but no discharge. Desired her to continue the ergot, and after taking it in the above doses for twenty-eight hours, she expelled a placenta of about three ounces in weight. The fetal surface was folded on itself. The maternal surface was of a pale straw colour, two-thirds of it looking like a bit of fat; the remainder of the maternal surface was dark red, but there was no trace of anything to indicate organic adhesion. The fetal surface was covered with the membranes, which ceased at its edge, and the insertion of the cord could be seen. Except that it was more dense in its structure when cut, the placenta seemed just the same as any other, and there were no signs whatever of putrefaction about it.

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

On a New Method of Sphygmographic Observation ; with Remarks on the Present Aspect of Vascular Physiology. By HENRY HARTSHORNE, M. D.

Some months ago, while standing upon the platform of a scale at a life insurance office, I noticed that a hand, whose motion on a dial-plate indicated the weight, vibrated in accordance with my pulse. Close inspection showed, not only that this accordance was exact, but that a definite series of movements could be observed ; four distinct impulses of the index hand. The first one was in the direction of diminution of weight, the hand moving as far as it would if my weight were lessened by half a pound. The second was in the opposite direction, as if by an increase of a whole pound in weight. The third was to the extent of a whole pound in the direction of diminution of weight ; and the last again in that of increase, half a pound. A trial some time later, under the depression of a temporary indisposition, gave, with the same order of succession, shorter movements by about one-third or one-fourth. Dr. Edward Hartshorne has, with different persons, observed considerable variations ; and has suggested, and contemplates having prepared, a registering apparatus ; for which, when constructed, I would propose the name *ballograph*, as a measure of the cardiac and vascular impulse.

Leaving such anticipated experimentation for its own future record, my present purpose is to call attention to this method of observation, and to remark upon the physiological explanation of the facts.

Reflection and actual trial, by careful horizontal and vertical movements of the arms while on the scale, have made it obvious to me, that the variation of the hand upon the dial-plate must have been produced by *impulses* of the circulation, in the one instance *upward*, with a force equal to the amount of deviation, and in the other instance *downward*. Now what could account for these alternate impulses ? The *time* of the whole series corresponded, without perceptible interval, with the time from the commencement of a pulsation at the wrist to its complete cessation ; three-eighths of that time, as I estimated it in my own person, belonged to the first two movements ; five-eighths to the last two. I believe the first, *upward* impulse (half pound) to be due to the expulsion of the blood from the left ventricle upwards into the aorta to its arch. The second, *downward* (one pound) to the descending movement of the great mass of the blood in the aorta and its branches. The third, again *upward* (one pound) to the general rebound of the arterial walls. The fourth, *downward* (half pound) to the closure of the semilunar valves of the aorta, and the consequent recoil or return of the blood.

These movements correspond nearly in succession with those recorded by Marey's sphygmograph, except that the complexity of their series is more distinct than the *diastole* of the latter. The upward impulse of the blood from the left ventricle to the arch of the aorta is, moreover, unmarked by

the sphygmograph. This last feature may, it appears to me, have some diagnostic value in affections of the heart. The second (downward) movement of the ballograph agrees with the first ascending line of Marey's instrument. The third agrees with the depression from the top of the wave in the latter. The fourth finds parallel in the sphygmographic mark, only when the latter is dicrotic. As to the theory of sphygmographic dicrotism, Marey ascribes it to the check of the aortic wave at the fork of the iliac arteries. But Naumann explains it more reasonably by the closure of the semilunar valves of the aorta; establishing this view by the proof that the dicrotous wave lessens in height in direct proportion to the distance of the vessel from the heart.

The occasion of these brief observations may serve to introduce a few words of remark upon the present aspect of vaso-motor physiology. Confident as were, a few years ago, and, indeed, still are, the declarations of Virchow and some others upon this subject, the invention of new modes and appliances of experiment has rendered necessary its re-examination. And, notwithstanding the (at least partial) adherence given by Marey, the most ingenious of late investigators upon it, to current views, I am bold to express the conviction that the facts have inaugurated some modification of those views, which must advance still farther.

Of the facts thus alluded to, some are the following. Chauveau observed¹ that compression of an artery, sufficient to stop the blood-current, does not always arrest the pulsation of the vessel; which has, therefore, an *autonomous* character, not simply dependent on the impulse from the heart. Bernard found, with his "differential manometer," that the *pressure* in an artery is *lessened* after division of the sympathetic nerve on that side. This refutes the opinion that the sympathetic causes by its innervation a *constraining* or *limiting*, instead of an actively propulsive contraction of the arteries.

Jonathan Hutchinson,² giving an account of seven cases of injuries to nerves, records, as (next to loss of sensation) the chief result of nerve-section, diminution of temperature. T. Nunn³ also describes a case of injury of the ulnar nerve, in which, two months after, the extremity had a temperature ten degrees lower than the other. Some similar observations have been made by Drs. Mitchell, Morehouse, and Keen. Such facts do not, of course, disprove the well-known immediate increase (sometimes of considerable duration) in heat following section of the sympathetic, as in Bernard's familiar experiment. But a distinction ought to be drawn, though it is generally overlooked, between the effects of a paralytic distension of and accumulation of blood in a vessel producing increase of heat, and a paralytic loss of power in arteries, gradually causing retardation of circulation, with permanent reduction of temperature.

In regard to secretion, Pflüger and Wittich have shown that it is influenced by nerves through their *direct* action upon the glands; as well as, or as they suppose instead of through the vessels. It is stated on the authority of Marshall⁴ that, in the *normal reflex* stimulation of the salivary glands, as by vinegar on the tongue, an active vascular excitement occurs, under which even the *veins pulsate*. We may then consider the

¹ Onimus and Viry, Journ. de l'Anat. et Physiologie, Nos. 1 and 2, 1866.

² London Hospital Reports, iii., 1866.

³ Pathological Transactions, 1866.

⁴ Treatise on Physiology, 1867.

checking of salivary secretion by powerful *irritation* of the sympathetic as altogether *abnormal* (pathological) and exceptional.

My observations, already spoken of, appear to me to suggest at least doubt in reference to the *dictum* of E. H. Weber upon the *pulse*; "*pulsus est non materies progrediens, sed forma materiei progrediens.*" Experiments by the French physiologists have shown, for the pulse wave-motion, a rapidity of thirty feet per second; for the particles of blood ten and a half inches per second. My estimate, based on the results of the ballo-graphic use of the scale as above mentioned, would be about twelve feet in a second for the blood-impulse on the average. Doubtless both movements, the wave and the mass motion, *differ* in different vessels and even at different times. Actual absence of mass movement in the blood is of course not supposed by Weber or others. All are familiar with the mode of proving its rapidity by the transmission of a chemical substance, shown by tests, through the whole round of the circulation.

A number of experiments which have attracted much attention, suggesting among other things the improbable doctrine of physiological or normal *inhibitory* function in certain nerves, have been made with currents of electricity. On the question of the true meaning of these some light has been lately thrown by Onimus,¹ who reports a series of experiments with *continued* and with *interrupted* currents upon animals. He asserts that *intermitting* currents, applied to the cervical ganglia of the sympathetic, caused spasmodic tetanic contraction of the muscular coat of the arteries, and diminution of the temperature. *Continued* currents, on the contrary, produced an exaggeration of the *proper contractile* action of the vessels and *augmentation* of temperature. These results are by Onimus reconciled with those obtained by Bernard and Brown-Séquard, and others, by recalling the fact that the latter have always made use of *interrupted* currents. He also cites Legros' proofs that neither intermittent currents nor paralysis of vasomotor nerves will produce *erection* in any of the erectile tissues.

The Mémoire of Chas. Legros upon the Anatomy and Physiology of the Erectile Tissues, is published in the first number of the *Journal de l'Anatomie et de la Physiologie* for this year. He demonstrates the extreme thickness and power of the muscular tissue of the arteries supplying erectile tissues, and declares that "*c'est bien l'élément contractile des artères qui agit pour produire l'érection.*" In gallinaceous birds, the blood ascends into the comb against gravitation; there the muscular coat of the arteries is of the greatest thickness.

I may add to these citations only a reference to some recent experiments of Lortet, of Lyons, upon the rate of movement both of the blood and of the pulse, with the hæmodromograph and sphygmoscope. He states that "*the dirotism of the speed of the blood-current corresponds exactly with the dirotism of the pulsation.*" This contradicts Weber's dictum of the *form* movement. Also Lortet ascertained, as had been concluded before, that "*even while the heart is at rest the blood is always in active movement, often with considerable speed.*"

I wish to end these desultory remarks with a brief appeal to a very simple course of reasoning, in reference to the question of the true action of the contractile tissue of arteries; upon which I am obliged, without intending presumption, to hold a view in opposition to generally prevailing opinions.

¹ Comptes Rendus des Séances de l'Académie des Sciences, 1867, t. lxxv. p. 250; and Journ. de l'Anat. et de la Physiologie, No. 1, 1868, p. 94.

Obviously, the forces that *can* act upon the blood-current in the arteries are three: 1. The heart's impulse; 2. The elasticity of the arterial walls; 3. The proper muscularity or muscular contractility of the arteries. We may leave out of this question, however important otherwise, the *vis a fronte*, or capillary and nutritive force. Of the three forces just named, the order of sequence *in time* is important. First must come or does come the impulse of the heart; the others, in so far as they act, must follow. No one denies the action or reaction upon distension of the elastic tissue of the artery. Then, as to the muscular element, several things are *conceivable*; that it takes no part at all; that it is always in action; that it is in fixed or "tonic" contraction; that it acts before the elastic coat or tissue does, or at the same moment with that, or after that tissue. Now which of these is probable—which is certain? Since the muscular contraction of the arteries occurs even after death, emptying them, we must reject at once the idea of its taking *no* part during the living circulation. It is not and cannot be *fixed* or *constant*, because in that case the touch of the finger would detect it, and, in the intervals of the pulse, the touch finds *no* resistance at all in any healthy artery. All suppositions, arguments, and facts, contravene the opinion that the muscular tissue of the arteries is brought into action (under the rhythmic movement of the circulation, or in consequence of the impulse of the heart), *sooner*, for each beat, than the elastic reaction. The great difficulty in accepting the simple view of Sir Charles Bell upon this subject, which difficulty in part has induced the ruling out of his opinion as "obsolete," has been the usual slowness of the unstriped, involuntary muscular tissue in its reaction upon stimulation. If the two tissues, muscular and elastic, acted and contracted at the *same* moment, both having been at rest before the heart's impulse, the result would be that the muscularity of an artery would not influence the rate of blood-movement one way or the other; except that, when the semilunar aortic valves have closed before the contraction is over, the effect must be to push the blood forward, with a force proportionate to the sum of the elastic tension and muscularity combined.

Of all the five possible suppositions named, however, the last is the most probable; viz., that, neither elastic nor muscular tissue having been in action at the moment when the heart's impulse begins, the elastic reaction comes first, and the muscular contraction afterwards. In which case it appears to my mind an inevitable conclusion, that the total effect of the arterial muscular contraction, *coming behind* or after the contractile wave-movement produced by elasticity, *must* accelerate or force onward the blood. I will not pause to argue this point farther in detail; merely repeating that the other alternatives are, essentially, that the muscular tissue in the arteries is totally null in effect, or that it is all the time maintaining the arteries in a certain fixed degree of rigidity and calibre, such as the most delicate sense of touch or sight, applied to the largest or smallest artery, gives no information of, but only contradicts. Yet the view now taught in the most approved works on physiology, and made the basis of very important conclusions in pathology and therapeutics, is, that the sole function of the muscularity of arteries is to limit the flow of blood through them; the artery exerting its power most actively when it allows the smallest amount of blood to pass. This doctrine, which has really in its favour nothing but the misconstruction of certain experiments on arteries with interrupted currents of electricity, producing a morbid and exceptional tonic or rigid contraction, may well be reviewed now in the light of the facts which have been

just alluded to, as well as of those which concern the general laws of muscular contraction, newly investigated by Marey especially with great ability and success.

Experiments showing the Occurrence of Vegetable Organisms in Human Blood. By JOSEPH G. RICHARDSON, M. D., Union Springs, Cayuga County, N. Y.

In the course of my examinations of nearly one thousand specimens of human blood during the past year, I have, in a large proportion of cases, met with the molecular substance denominated by Prof. Salisbury "*zymotosis translucens*." In severe cases of rheumatism and neuralgia I have found long strings of these transparent granules, and occasionally homogeneous filaments; in the blood of patients afflicted with some other diseases, and of individuals enjoying comparative health, these particles were single, or adherent in rows of two to five or more, such rows often showing a tendency to become branched. They are doubtless identical with the so-called "globulins" of Donné (*Cours de Microscopie*, p. 85, Paris, 1844), and the "molecular substance" of Griffith and Henfry (*Micrographic Dictionary*, 2d edition, p. 92, London, 1860). But, in addition to them, I was at first surprised to find, in a few instances, that the blood contained in almost every field numerous minute, rounded particles, much more distinct than those above mentioned; not, like them, fading rapidly from view; having an active rotary or erratic motion, and strongly resembling the primary stage of certain infusoria, as seen in solutions of decomposing animal matter. They appeared in cases where the pulse was feeble and intermittent, the blood anæmic, and the powers of life at a low ebb; and diminished in number under tonic treatment, especially the administration of tincture of chloride of iron. It occurred to me that by this property of independent movement we might be able to recognize the existence of independent organisms within the blood, and thus obtain a strong presumptive evidence in favour of Prof. Salisbury's novel theories concerning the vegetable origin of disease; and in order to test the correctness of this surmise the following investigation was undertaken:—

Expt. 1. A drop of blood drawn from my own arm was placed upon a slide, and a minute portion of water, which had been standing four days upon some fragments of beef, and which, examined a few minutes before, exhibited multitudes of vibriones, was mixed with it, and the whole covered with a thin glass. Upon adjusting it under the microscope, the vibriones were found to be moving, some rapidly, some slowly, and some only as borne by the currents among the blood-corpuscles, apparently unaffected by the change of world which they had undergone. By arranging a filament of thread from the reservoir upon the growing slide, so as to supply the loss of fluid by evaporation, I was able to watch their progress, at short intervals, for about nine hours, which was, as far as I could judge, uninterrupted towards the formation of vibratile filaments resembling the early stages of development in the so-called *Leptothrix Buccalis* found so abundantly in the tartar on the teeth. One particular filament, which was carefully watched, and of which drawings were made from time to time, whose movement, when first observed, was very active and constant, grew from a length of about $\frac{1}{1500}$ th of an inch to that of about the $\frac{1}{1000}$ th of an inch in eight hours, to that of about $\frac{1}{800}$ th of an inch in seventeen hours; and at the end of twenty-three hours, when the experiment was interrupted, had attained a length of about $\frac{1}{500}$ th of an inch. The process of development seemed to be accompanied with a disposition to bend sharply at intervals of perhaps $\frac{1}{2000}$ th of an inch, and shoot forth from the salient angle a branch equal in size to the parent trunk. As the organism increased in length, its movement diminished in rapidity, until towards the close of the experiment it nearly or quite ceased;

its breadth continued the same throughout, and appeared to be about $\frac{1}{200000}$ th of an inch.

According to the conclusions of Prof. J. Wyman, in his paper on the existence of living organisms in heated water,¹ neither vibrios nor bacteriums appeared (in water containing beef-juice) if the boiling was prolonged beyond the period of five hours; and the Professor quotes Pasteur² to the effect that the spores of some kinds of cryptogams (even those most salamander like, he appears to mean) perish at a dry heat of 266° F., so that the slides and covers used in the following experiment, being, after thorough cleansing, burnt off in the flame of an alcohol lamp, may probably be considered free from any such impurity.

Expt. 2. Jan. 6, 1868, at $8\frac{1}{2}$ P. M., two hours after a slight supper, I drank a fluidounce of water, which, having stood upon some fragments of beef for two days, contained, as counted under the microscope, on an average (the mean of ten enumerations) about 14 vibriones and bacteria to each square $\frac{1}{10000}$ th of an inch; a drop (or minim) being spread out under a thin glass one inch square, so that the $\frac{1}{3}$ included, in round numbers, 7,000,000,000 of living organisms. This compound, although sufficiently repugnant to the palate, had no nauseating effect upon the stomach beyond that fairly attributable to mental disgust, and probably possessed no higher aroma than a professed gourmand used to enjoy in the saddle of venison which had garnished his larder until it acquired the true game flavour. Half an hour after the imbibition of the mixture, a drop of blood drawn from my arm, and examined on a slide simply wiped clean, showed, on rigid scrutiny during another half hour, but a single moving molecule. At $9\frac{1}{2}$ P. M. a glass and cover, heated far beyond the limit above given as compatible with organic life, and scrupulously protected from exposure to deposits from the atmosphere, were used for the examination of another drop of blood, in which four molecules in active motion, precisely resembling that of infusoria seen in *Expt. 1st*, were visible. A drop drawn at 10 P. M., and examined between a glass and cover prepared with the same precautions, exhibited six specimens of moving bodies; while in a drop drawn at $10\frac{1}{2}$ P. M., only two were detected during a careful search of half an hour's duration.

Expt. 3. At 7 P. M., Jan. 7, 1868, four hours after dinner I swallowed four fluidounces of water which had been standing some seventy hours upon fragments of beef, and which, according to the data of experiment 2d, contained at least 27,000,000,000 living organisms. As this test was intended to be as far as possible a crucial one, at 8 o'clock I prepared a slide and cover in the following manner: after washing them thoroughly and drying them on a clean cotton cloth I applied a drop of strong hydrochloric acid to the middle of the slide and laid upon it the glass cover, taking care that by suitable pressure the acid was evenly distributed between the surfaces; raising the cover after about a minute I held it by means of forceps in the flame of an alcohol lamp until all the acid was volatilized and then placed it carefully under a small bell glass—the slide itself was similarly treated, and when both were quite cool a drop of blood (obtained from an incision made through integument painted with tr. ferri chlor.) was touched to the slide which was quickly transferred beneath the bell glass applied to the glass cover, and the whole reversed and placed upon the microscope stage. The lenses being adjusted, I found the blood remarkably full of moving particles precisely resembling to my eye specimens of vibrio bacillus; these were so abundant that I counted twelve in about as many minutes, and at one time three were visible in the same field. At a quarter before nine another drop of blood drawn from a new incision near the last was examined between a slide and cover prepared exactly as the previous one, and with the same result except that the revolving particles were fewer in number, only four being observed whose motion was unmistakable. At half past nine another drop from the second

¹ See this Journal, p. 283, Jan. 1868.

² Am. Journ. Sc. and Arts, p. 164, from Ann. de Sci. Nat., t. xvi. p. 81, 1861.

incision reopened was examined between a slide and cover that had been simply heated without the application of acid, and on careful scrutiny for about half an hour only revealed three moving molecules. In examining for these I found a satisfactory method, after discovering one which changed its place under the lowest eye piece, was to put on that containing the cobweb micrometer, by which at least mistakes proceeding from oscillation of the head or vibration of the instrument were readily corrected.

But such investigations being made with only a one-eighth inch objective, and the lowest eye-piece of a Powell and Lealand's instrument, could not furnish positive proof that these moving particles were not merely inorganic matter undergoing molecular movement, or that if organized they were not the primary constituents or disintegrating residuum of white blood-corpuscles, and I therefore obtained from Mr. Wm. Wales an "Immersion" lens, having nominally but one-twenty-fifth inch focal length, for the purpose of verifying and extending my conclusions. This glass affords a power of about eleven hundred diameters with very clear definition, and after some preliminary study of the organisms in decomposing beef-juice, I made with its aid the following researches:—

Expt. 4. At 7.45 P. M., May 17, 1868, I drank four fluidounces of water similar to that employed in the preceding investigations, and containing multitudes of bacteria. At a quarter past eight I examined a drop of blood drawn with a cataract needle from the tip of my finger, and confined between a slide and cover cleaned with strong hydrochloric acid as above described; under the field of the one-twenty-fifth inch glass, the interspaces between the rows of blood-corpuscles were found to contain multitudes of apparently spherical molecules in rapid and erratic motion—but so very minute as to readily escape notice even with this high power, except under the closest scrutiny; in the course of half an hour not less than one hundred were observed. At 9 P. M., another drop of blood examined with the same precautions exhibited in addition to these minute particles, other bodies less active in their movements, of much greater magnitude, and which under an amplification of eleven hundred diameters, appeared precisely similar to the bacteria I had been studying a few hours before in the identical decomposing beef-juice imbibed. Five of them were thus enlarged sufficiently to exhibit an unmistakable organized structure totally different from their associated aggregations of Beale's "germinal matter." (Plate XXVII. Fig. 208, *Microscope in Practical Medicine*.) Three of these bacteria were each about $\frac{1}{25000}$ of an inch in length and $\frac{1}{25000}$ of an inch in width, very distinctly sufficiently in the middle; a fourth was obviously composed of four and a fifth of six joints, arranged in a straight line, whose motion was of that peculiar waving character so universal among the Oscillatoriaceæ—the last two were most clearly visible when they happened to lie vertically to the surface of the glass, and would probably escape observation under the one-eighth inch, except in that position, and be therefore mistaken for simple globular bodies, although in several cases I detected in the second and third experiments a shadowy elongation of one diameter in the revolving molecules then observed.

In view of the statement of M. Davaine to the French Academy of Medicine (*Medical News and Library*, vol. xxvi. p. 28), asserting a close connection between the appearance of bacteria in the blood and the occurrence of carbuncular disease, it is worthy of remark that neither at, nor subsequent to, either of the three occasions in which I thus impregnated my blood with infusoria, were there any symptoms of carbunculous or other inflammatory malady. The only disturbances of the economy observed were headache, furred tongue, dryness of the throat, and slight diarrhoea, which all passed off in a day or two, the offending organisms being apparently soon eliminated by the various outlets for effete or

noxious materials; even these deviations from health may have been accidents, the results of other causes.

Although I am well aware that the plans adopted do not preclude the possibility of error through the introduction of living organisms into the blood after it has left the walls of its vessels, yet I think most candid inquirers will admit that the fact that an increased number of moving particles were visible after an increased dose of vibriones (contained in the draught above mentioned *whose swarming population exceeded more than twenty times the sum total of every man, woman, and child who walks upon our earth*), and at the same time *in spite* of increased precautions which the most stubborn sceptic must acknowledge would have a tendency to diminish the chances of deception, goes far to prove that multitudes, probably millions, of infusoria, thus entering the stomach, find their way into the blood in a few hours, and, retaining their independent vitality, circulate with that vital fluid through the minutest ramifications of the arteries, and penetrate to every portion of the human system. And if this be true, how strong becomes the presumption that there are other plants more deleterious in their growth or more poisonous in their nature, which also thrive under certain circumstances within the blood, and each constitute the essence, the real *contagium*, of some so-called zymotic disease, as, for example, diphtheria and scarlet fever, smallpox and measles, as declared long ago by Prof. Salisbury, of Cleveland, and recently by Prof. Hallier, of Jena.

Case of Complete Transposition of the Viscera Diagnosed during Life. Reported by JAMES H. HUTCHINSON, M. D., one of the Attending Physicians to the Pennsylvania Hospital.

Although transposition of the viscera occurs with sufficient frequency, yet in most of the reported cases the condition has been recognized for the first time either in the dead room or on the dissecting table: in the case which I am about to record, the man, who is the subject of it, is still living, and the malposition of the organs was distinctly made out by the application of the methods of physical diagnosis. For the notes of the case I am indebted to Dr. I. Minis Hays.

J. G. O'N., æt. 28, an Irishman, employed as a travelling agent by a publishing house, has always had good health, with the exception of the dyspepsia for which he is at present under treatment in the hospital, and of a slight illness twelve years ago, which he thinks was diagnosed pleurisy, but there are no signs present of that affection ever having existed. He is rather short in stature, his voice is weak and effeminate, and his manner indicates a nervous temperament. When admitted he told me that he could feel the heart beating on the right side of the chest, and asked whether it was possible that he had transposition of the viscera; to which subject his attention had been directed by reading an account of two cases in one of the daily papers.

Upon placing my hand over the right mammary region I felt the apex of the heart pulsating in the fifth interspace just within the right nipple, and it was in this region that the sounds of the heart were most distinctly heard. My interest was, of course, at once awakened in the case, and I made in consequence a thorough physical examination of the patient with the following result: entire absence of cardiac dulness over the region usually occupied by the heart, and its presence clearly made out in the corresponding region on the right side; dulness due to the presence of the

liver on the left side, that due to the spleen on the right side; resonance from the cardiac extremity of the stomach on the right side; the respiration in the left infra-clavicular region resembled that usually heard on the right side—in other words, it was of the character described by Flint as broncho-vesicular. This region likewise furnished us with more marked vocal resonance and vocal fremitus than the corresponding region on the right side. To detect the position of the sigmoid flexure the following method was adopted: the right iliac region was percussed and found to be resonant; a large injection of water was then administered, and it was again percussed and found to be dull; and the dulness again gave place to resonance when the injection was passed. The rectum on exploration was found to ascend towards the right side and the right testicle to hang lower than the left. The man is not left handed.

I may add that several other physicians have examined the case, and that all of them are entirely satisfied that transposition exists.

DOMESTIC SUMMARY.

Physiological Action of Caffein and Thein.—In our No. for April last, p. 525, we gave the results of the experiments of M. Leven in regard to the physiological action of caffein, and in our present No., p. 260, will be found the conclusions of the same experimenter in regard to the action of thein.

The *Boston Med. and Surg. Journal* (May 28, 1868) contains an account of a number of experiments made by Dr. R. AMORY with the assistance of Mr. Fitz, with these same alkaloids. The animals experimented on were guinea pigs, cats, dogs, pigeons, and rabbits. The following are Dr. Amory's conclusions from his experiments:—

"1. That this drug poisons by exhausting the muscular contractility throughout the body, and affecting last of all the muscles of the heart.

"2. That the spinal cord is that part of the nervous system principally affected, as shown by the convulsions in all the experiments, and, most conclusively, in these last experiments where the posterior train was not convulsed.

"To these I might add another effect: that the involuntary as well as the voluntary muscles were stimulated and exhausted till their death or loss of power, as shown by the continued discharges from the bowels and bladder, as well as the quickening and, secondarily, impairment of circulation and respiration.

"With regard to its use as a therapeutic agent, there is much to say. It can be used where we wish to stimulate muscular and nervous action. So powerful an agent must also be used cautiously, and the abuse of coffee and tea should be guarded against. I should hope, from its peculiar action, that it may be useful in opium poisoning, and it is known that coffee after a dose of opium is very refreshing. But it must be remembered that though the primary action is excitant, the secondary action is depressant. It should also be borne in mind that coffee little roasted is soothing, and when over-roasted exciting to the nervous system. The dose of caffein, as used by Prof. Oppolzer in cases of nervous headache and hemispheres, is one grain combined with an equal weight of quinine, as Dr. F. B. Greenough lately informed me."

Gunshot Wound of the Knee-Joint with Fracture of the Patella.—Dr. JAS. J. ROOKER, of Castleton, Ind., records (*Western Journ. Med.*, May, 1868) the case of a farmer æt. 40, in good health, who was accidentally shot in the knee-joint Sept. 10, 1866. The ball entered the inside of the right knee, fracturing the patella into five pieces, and passing upwards and backwards, lodged in the thigh. An examination was made by several physicians, and every justifiable means to extract the ball having been used without success it was determined to apply cold water-dressings and to "trust to nature." Dr. R. saw the patient

an hour after the accident, and had him subsequently in charge. The following day the patient was removed home twelve miles distant, his leg was placed in a fracture-box with his heel elevated, and ice water-dressings with an opiate at night constituted the treatment. This was continued for three weeks, after which the limb was put into splints in which it remained for two months. There was no suppuration. On Nov. 1, 1867, Dr. R. says the patient was in excellent health, and able to follow his occupation; the fragments of patella have united by short ligamentous union.

Ring Treatment of Fractures of the Patella.—Prof. BLACKMAN states (*Western Journ. Med.*, May, 1868) that he has successfully treated a case of fractured patella by means of the ring as lately recommended and employed by Dr. W. A. GIBSON, of St. Louis (see No. of this Journal for Jan. 1867, p. 281), and with his characteristic learning, he shows that this mode of treatment, of late years entirely forgotten, has a very ancient origin. It was employed by Albucasis, and approved by Guy de Chauliac, J. de Vigo, and Bassuet, who adopted it at the Hôtel Dieu of Paris, in the latter half of the 18th century. Permanus' ring, the little hat of Meibomius, and the wooden cap of Karlschmidt, all of which are referred to by Malgaigne (*Treatise on Fractures*), are of the same character. Heister, also, in his great work on surgery, published in 1739, which may be referred to by modern surgeons with advantage, states that he used with success the ring treatment by means of a perforated plaster, intended to include and hold fast the fractured knee-pan after it was set.

Iron Rod Projected through Head; Recovery.—Dr. M. JEWETT, of Middlebury, Ohio, records (*Western Journ. Med.*, March, 1868) the case of a Frenchman 27 years of age, who, while blasting coal, was struck by the blasting barrel (a $\frac{3}{4}$ inch gas pipe four feet long) near the external angle of the superciliary ridge of the right side, and in its course it passed through the bone, fracturing the orbital plate through the right anterior lobe of the brain, lacerating the longitudinal sinus through the left middle lobe, and emerged at a point about an inch and a half above and behind the left ear. The rod lodged after entering about one-half its length, and was extracted by his companions not without considerable difficulty and force, owing to a bend in a portion of the rod in the patient's skull. For several days he was almost entirely comatose. Cold was applied to head, his bowels kept open by large doses of podophyllum and calomel, "the wound was kept open by frequent deep probings," and the head so placed as to favour drainage. Fragments of bone, coagulated blood, and broken up brain tissues, were freely discharged. About the twelfth day he began to show signs of consciousness, took nourishment, and at times seemed to comprehend what was said to him. "He gradually improved after the third week, and in eight weeks from the time of receiving the injury, was able to leave his bed. There was, at no time, any marked paralysis.

Physically, he now seems as well as ever. He seems to be perfectly rational, and will reply correctly in *monosyllables* to questions, but is entirely unable to *connect words*. He succeeds best, when excited, in swearing in French. This difficulty shows that that portion of the brain controlling speech was seriously and probably irreparably injured. Up to this date, January 24, 1868, over eight months from the injury, he shows no improvement in this particular. The amount of mental power is also much impaired.

A somewhat similar case is recorded by Dr. Bigelow, in the number of this Journal for July, 1850.

Bromide of Potassium.—By referring to the Transactions of the College of Physicians, published in the present No. of this Journal, it will be seen that Dr. Packard stated at the meeting on the 5th of June, 1867, that he had employed successfully in several cases the bromide of potassium in the sickness of pregnancy. Dr. D. W. HODGKINS relates (*Boston Medical and Surg. Journ.*, April 9, 1868) a case of morning sickness of pregnancy cured by the same means. He gave a dessertspoonful every two hours of a solution of half an ounce of bromide of potassium in four ounces of water.

THE JEFFERSON MEDICAL COLLEGE OF PHILADELPHIA.

The FORTY-FOURTH WINTER SESSION of Lectures will commence on Monday, October 12th, with a General Introductory Lecture by Professor PANCOAST. The regular Course will begin the day after. The Session will terminate on the 28th day of February, 1869.

CHARLES D. MEIGS, M. D.,	{	Emeritus Professor of Obstetrics and Diseases of Women and Children.
ROBLEY DUNGLISON, M. D.,	{	Emeritus Professor of Institutes of Medicine and Medical Jurisprudence.

JOSEPH PANCOAST, M. D.,	Professor of General, Descriptive, and Surgical Anatomy.
SAMUEL D. GROSS, M. D.,	" Institutes and Practice of Surgery.
S. HENRY DICKSON, M. D.,	" Practice of Medicine.
ELLERSLIE WALLACE, M. D.,	" { Obstetrics and Diseases of Women and Children
B. HOWARD RAND, M. D.,	" Chemistry.
JOHN B. BIDDLE, M. D.,	" Materia Medica and General Therapeutics.
J. AITKEN MEIGS, M. D.,	" { Institutes of Medicine and Medical Jurisprudence.

J. M. DACOSTA, M. D.,	Lecturer on Clinical Medicine.
WM. HENRY PANCOAST, M. D.,	Demonstrator of Anatomy.

To enlarge the already abundant opportunities for CLINICAL INSTRUCTION, a Clinic will be held daily at the College—the Surgical department being conducted by Professors Gross and Pancoast; the Obstetrical by Professor Wallace; and the Medical by Dr. J. DACOSTA.

The lectures are so arranged as to permit the student to attend the Clinics of the Pennsylvania Hospital, and of the Philadelphia Hospital.

The Summer Course, which began in April and is conducted by Members of the Faculty in conjunction with others, will be resumed in September after the recess of July and August, and continued until some time in October.

FEES.—To each Member of the Faculty—as in all the schools of Philadelphia and New York—\$20, in all \$140

Matriculation fee, paid once only	5
Graduation fee, ...	30

Matriculants of last session, 353. Graduates, 159.

SAMUEL HENRY DICKSON, M. D., *Dean of the Faculty.*

PHILADELPHIA SCHOOL OF ANATOMY,

Chant Street, Tenth Street near Chestnut, rear of St. Stephen's Church.

The Winter Course at the Philadelphia School of Anatomy will begin on Tuesday, October 13, 1868, and will continue till the first of March, 1869.

A Systematic Course of Lectures on Descriptive and Surgical Anatomy will be delivered on Mondays, Tuesdays, Thursdays, and Fridays, at 7 o'clock P. M., illustrated by Dissections, Models, Drawings, &c. The Microscopic Anatomy of the various tissues will be shown by the Class Microscope.

Dissection will be carried on under the direct and personal supervision of Dr. KEEN and his Assistant Demonstrators of Anatomy. The Rooms will be open also during all the month of September for dissection, together with Lectures on the Brain and nervous system.

Special facilities will be afforded students, candidates for the Army or the Navy, or others who may desire to take a Course on Operative Surgery, at any time, in classes or singly.

Fee for the Course of Lectures on Anatomy, \$10.

For further information, apply at the Rooms, or to

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1619 Chestnut Street.

UNIVERSITY OF PENNSYLVANIA.

Ninth Street, above Chestnut, Philadelphia.

MEDICAL DEPARTMENT.

ONE HUNDRED AND THIRD SESSION—(1868-69).

FACULTY.

GEORGE B. WOOD, M. D.,	Emeritus Professor of Theory and Practice of Medicine.
SAMUEL JACKSON, M. D.,	Emeritus Professor of Institutes of Medicine.
HUGH L. HODGE, M. D.,	{ Emeritus Professor of Obstetrics and the Diseases of Women and Children.
JOSEPH CARSON, M. D.,	Professor of Materia Medica and Pharmacy.
ROBERT E. ROGERS, M. D.,	Professor of Chemistry.
JOSEPH LEIDY, M. D.,	Professor of Anatomy.
HENRY H. SMITH, M. D.,	Professor of Surgery.
FRANCIS G. SMITH, M. D.,	Professor of Institutes of Medicine.
R. A. F. PENROSE, M. D.,	{ Professor of Obstetrics and the Diseases of Women and Children.
ALFRED STILLÉ, M. D.,	{ Professor of Theory and Practice of Medicine, and of Clinical Medicine.
D. HAYES AGNEW, M. D.,	{ Demonstrator of Anatomy, and Assistant Lecturer on Clinical Surgery.

The Lectures of the Session of 1868-69 will begin on the second Monday, 12th of October, and close on the last day of February ensuing.

AUTUMN COURSE OF PRELIMINARY LECTURES FOR 1868.

This Course will commence on Monday, September 7, and terminate on October 10.

The Lectures will be delivered as follows:—

Microscopy,	JAMES TYSON, M. D.,	Microscopist to the Philadelphia Hospital.
Regional Anatomy,	D. HAYES AGNEW, M. D.,	Surgeon to the Pennsylvania Hospital.
Physical Diagnosis,	JAMES J. LEVICK, M. D.,	Physician to the Pennsylvania Hospital.
Diseases of the Skin,	H. LENOX HODGE, M. D.,	Physician to the Children's Hospital.
Morbid Anatomy,	{ WILLIAM PEPPER, M. D.,	Physician and Pathologist to the Philadelphia Hospital.

Admission free.

One Introductory will be delivered to the Course.

Clinical Instruction is given throughout the Session, in the Medical Hall, by the Professors, and at the Hospitals. At the Philadelphia Hospital, containing 900 beds, instruction is free.

The Dissecting Rooms, under the superintendence of the Professor of Anatomy and the Demonstrator, are open from the first of September.

The room for Operative Surgery and the Application of Bandages, &c., is open early in September and throughout the Session, under the supervision of the Professor of Surgery.

Surgical Demonstrator, JAMES COLLINS, M. D.

Fees for the Lectures (each Professor \$20)	\$140
Matriculation Fee (paid once only)	5
Graduation Fee	30

R. E. ROGERS, M. D., *Dean of the Medical Faculty,*

W. H. SALVADOR, *Janitor,*
University Building.

University Building.

P. S.—Board may be had at from \$4 50 to \$6 per week.

AUXILIARY FACULTY OF MEDICINE.

HARRISON ALLEN, M. D.,	Professor of Zoology and Comparative Anatomy.
HORATIO C. WOOD, JR., M. D.,	Professor of Botany.
F. V. HAYDEN, M. D.,	Professor of Mineralogy and Geology.
HENRY HARTSHORNE, M. D.,	Professor of Hygiene.
JOHN J. REESE, M. D.,	{ Professor of Medical Jurisprudence, including Toxicology.

The Fourth Course of these Lectures will commence on the first Monday in April, 1869, and continue until the last of June. Free to all Students of the regular Medical Course.

BELLEVUE HOSPITAL MEDICAL COLLEGE—CITY OF NEW YORK.

SESSIONS OF 1868-69.

THE Collegiate Year in this Institution embraces a Preliminary Autumnal Term, the Regular Winter Session, and a Summer Session.

The Preliminary Autumnal Term for 1868-69, will commence on Wednesday, September 16, 1868, and continue until the opening of the Regular Session. During this term, instruction, consisting of didactic lectures on special subjects and daily clinical lectures, will be given, as heretofore, exclusively by members of the Faculty. Students designing to attend the Regular Session are strongly recommended to attend during the Preliminary term, but attendance during the latter is not required.

The Regular Session will commence on Wednesday, October 14, and end about the 1st of March, 1869.

The Summer Session for 1869 will commence on the second Wednesday in March, and continue twelve weeks. This term will embrace courses of didactic lectures by the members of the Faculty of the Summer Session, together with clinical lectures at Bellevue Hospital, and the Charity Hospital, Blackwell's Island, and the daily recitations. Lectures will also be given by members of the College Faculty.

FACULTY OF THE COLLEGE.

ISAAC E. TAYLOR, M. D., Emeritus Professor of Obstetrics and Diseases of Women and Children, President.

JAMES R. WOOD, M. D., Emeritus Professor of Surgery.

FRANK H. HAMILTON, M. D., Professor of Practice of Surgery with Operations.

LEWIS A. SAYRE, M. D., Professor of Orthopedic Surgery.

ALEXANDER B. MOTT, M. D., Professor of Surgical Anatomy with Operations.

W. H. VAN BUREN, M. D., Professor of Principles of Surgery with Diseases of the Genito-Urinary System.

GEORGE T. ELLIOT, M. D., } Professors of Obstetrics and the Diseases of Women
FORDYCE BARKER, M. D., } and Children.

BENJAMIN W. MCCREADY, M. D., Professor of Materia Medica and Therapeutics.

STEPHEN SMITH, M. D., Professor of Descriptive and Comparative Anatomy.

AUSTIN FLINT, M. D., Professor of the Principles and Practice of Medicine.

R. OGDEN DOREMUS, M. D., Professor of Chemistry and Toxicology.

AUSTIN FLINT, Jr., M. D., Professor of Physiology and Microscopy.

WILLIAM A. HAMMOND, M. D., Professor of Diseases of the Mind and Nervous System.

N. R. MOSELY, M. D., Demonstrator of Anatomy.

J. W. SOUTHACK, Jr., M. D., Assistant Demonstrator of Anatomy.

FACULTY OF THE SUMMER SESSION.

HENRY D. NOYES, M. D., Professor of Ophthalmology, and Dean of the Summer Faculty.

J. LEWIS SMITH, M. D., Professor of Morbid Anatomy.

FOSTER SWIFT, M. D., Professor of Diseases of the Skin.

Prof. WM. H. VAN BUREN, M. D., Lecturer on Diseases of the Genito-Urinary System.

Prof. AUSTIN FLINT, Jr., M. D., Lecturer on Microscopical Anatomy.

Prof. GEORGE T. ELLIOT, M. D., Lecturer on Diseases of Children.

Prof. WILLIAM A. HAMMOND, M. D., Lecturer on Diseases of the Nervous System.

A. W. WILKINSON, M. D., Assistant to the chair of Chemistry, in charge of the Practical Laboratory.

A distinctive feature of the method of instruction in this College, is the union of clinical and didactic teaching. All the lectures are given within the hospital grounds. During the Regular Winter Session, in addition to four didactic lectures on every week day, except Saturday, two or three hours are daily allotted to clinical instruction. The union of clinical and didactic teaching will also be carried out in the Sum-

BELLEVUE MEDICAL COLLEGE—CONTINUED.

mer Session; nearly all of the teachers in this Faculty being physicians and surgeons in the great Charity Hospital on Blackwell's Island.

Fees for the Regular Session.

Fees for tickets to all the lectures during the Preliminary and Regular Term, including clinical lectures, \$140.

Tickets for any of the several departments may be taken out separately.

Matriculation fee, \$5.

Demonstrator's ticket (including material for dissection), \$10.

Graduation fee, \$30.

Fees for the Summer Session.

Matriculation fee (valid for the succeeding Winter Session, \$5.

Fee for each of the separate courses of lectures, 10.

General ticket admitting to all the lectures, \$50.

Graduates of the Bellevue Hospital Medical College will be admitted to the lectures of the Summer Session on the Matriculation ticket; all others will be required to take out tickets.

The Dissecting-room will be kept open until about the first of May.

Payment of fees is invariably required at the commencement of the Session. There are no exceptions to this rule.

Students, on arriving in the city, are requested to report at once at Bellevue Hospital, situated on the East River, between 26th and 28th Streets, and inquire for the Janitor of the College, who will take pains to aid them in securing comfortable accommodations without delay. Entrance to the Hospital is on 26th Street.

For the Annual Circular and Catalogue, giving regulations for graduation and other information, address the Secretary of the College, Prof. AUSTIN FLINT, Jr., Bellevue Hospital Medical College.

A circular for the Summer Session will be issued about the first of January, 1869.

O'REILLY PRIZE.

Dr. JOHN O'REILLY, of New York, having offered, through the N. Y. Academy of Medicine, a Prize of Six Hundred Dollars for an Essay on the Physiology and Pathology of the Sympathetic or Ganglionic Nervous System, the Committee of Award, appointed by the Council of the Academy, have adopted, with the concurrence of the Council, the following Regulations:—

I. The competing Essays shall be sent in to the Chairman of the Committee, Prof. J. C. DALTON, M. D., No. 101 East Twenty-third Street, New York, on or before the first day of March, 1869.

II. Each Essay shall be marked with some distinguishing device or motto, and accompanied by a sealed envelope bearing the same device or motto, and containing the name and address of the writer.

III. The Essay selected by the Committee shall be transmitted by them, together with its accompanying envelope, to the Council of the N. Y. Academy of Medicine, under whose direction the envelope shall be opened, and the name of the writer announced at the first meeting of the Academy in May, 1869.

IV. This Prize is open for Universal Competition

V. The Committee have a right to reject whatever does not come up to a proper standard of merit.

ALFRED C. POST, M. D.,

President of the Academy, on behalf of the Council.

Committee of Awards.

J. C. DALTON, M. D.,	{ Professor of Physiology in the College of Physicians and Surgeons, New York.
A. FLINT, JR., M. D.,	{ Professor of Physiology in the Bellevue Hospital Medical College, New York.
ALFRED L. LOOMIS, M. D.,	{ Professor of the Institutes and Practice of Medicine in the University Medical College, New York.

Medical Journals are particularly requested to copy.

New York, December, 1867.

PHILADELPHIA SUMMER SCHOOL OF MEDICINE,

No. 920 CHESTNUT STREET, AND COLLEGE AVENUE, PHILADELPHIA.

ROBERT BOLLING, M. D.

EDWARD A. SMITH, M. D.

JAMES H. HUTCHINSON, M. D.

D. MURRAY CHESTON, M. D.

H. LENOX HODGE, M. D.

HORACE WILLIAMS, M. D.

GEORGE C. HARLAN, M. D.

The fourth session of the Philadelphia Summer School of Medicine will begin March 1st, 1868, and will continue until October.

Clinical Instructions will be given from the first of March to the first of October.

Lectures and Examinations will take place daily during April, May, June, and Sept.

EXAMINATIONS.

ANATOMY,

CHEMISTRY,

PHYSIOLOGY,

SURGERY,

MATERIA MEDICA,

OBSTETRICS,

PRACTICE OF MEDICINE.

OPERATIVE AND MINOR SURGERY.—Lectures and Demonstrations of Bandaging and Dressing of Fractures upon the Manikin and of Surgical Anatomy and Operations upon the Cadaver, by H. Lenox Hodge, M. D.

PERCUSSION AND AUSCULTATION IN DISEASES OF THE LUNGS AND HEART.—Lectures and Clinical Examination of patients, by James H. Hutchinson, M. D.

MICROSCOPE.—The structure of the Microscope, and the manner of using it, will be explained, and the microscopical appearance of the tissues and fluids in health and disease will be exhibited, by Horace Williams, M. D.

URINARY DEPOSITS AND TESTS.—Students will be instructed in the microscopical and chemical examination of the urine, and will be enabled to make themselves familiar with the necessary manipulations, by James H. Hutchinson, M. D.

DISEASES OF THE EYE.—Lectures upon the Anatomy, Physiology, and Diseases of the Eye, by George C. Harlan, M. D.

DISSECTIONS AND SURGICAL OPERATIONS may be practised by the members of the class.

THE SOCIETY OF THE MEDICAL INSTITUTE meets once every month.

CLINICAL INSTRUCTION.

PENNSYLVANIA HOSPITAL.—The advantage of attending the Lectures, Operations, and Clinical Examinations of patients at this important hospital will be secured without charge.

EPISCOPAL HOSPITAL.—Drs. Hutchinson and Smith will take the class through its well-arranged wards, so that by the bedside disease may be accurately studied.

CHILDREN'S HOSPITAL.—Much of a physician's practice being among children, it is essential that their various disorders should be seen by the student. Drs. Hodge, Hutchinson, and Cheston will, during the session, have charge of the numerous out-door and in-door patients of this establishment, and will offer every facility to the class.

DISPENSARY FOR DISEASES OF THE HEART AND LUNGS will be conducted by Dr. Hutchinson in connection with his lectures.

FEE FOR THE WHOLE COURSE FIFTY DOLLARS.

Or any part may be taken separately.

OFFICE STUDENTS will be received by Drs. Bolling, Hutchinson, and Hodge, for the whole or part of a three years' course of study. They will be admitted to the Summer School and to the Winter Examinations, and Clinical Instruction will be provided for them at the Pennsylvania, Philadelphia, Episcopal, and Children's Hospitals. They will be given special instruction in the Microscope, Practical Anatomy, Percussion and Auscultation, Practical Obstetrics, Bandaging and Operative Surgery. They will be enabled to examine persons with diseases of the heart and lungs, to attend women in confinement, and to make microscopical and chemical examinations of the urine.

WINTER COURSE OF EXAMINATIONS will begin with the Lectures at the University of Pennsylvania in October, and will continue till the close of the session.

Candidates for admission to the Army and Navy, and those desiring promotion to a higher grade, may obtain private instruction.

Fee for Office Students (one year) \$100

Fee for one Course of Examinations 30

Class-Rooms, No. 920 Chestnut Street. Anatomical and Surgical House, College Avenue.

Apply to

H. LENOX HODGE, M. D.,

N. W. corner Ninth and Walnut Streets, Philadelphia.

ALBANY MEDICAL COLLEGE.

The next Course of Lectures in this college will commence on the first Tuesday in September, and continue sixteen weeks.

Materials for dissection are abundant, and furnished to students on as reasonable terms as at any similar institution in the country. A spacious Hospital has been opened nearly opposite the College, to which students are admitted free of charge.

Clinical Lectures are delivered in the Hospital three days in the week. Surgical Cliniques are held regularly in the Hospital and College.

The working Laboratory of the College is open during the year for work and instruction in Practical Chemistry.

PROFESSORS.

ALDEN MARCH, M. D., Principles and Practice of Surgery.

JAMES McNAUGHTON, M. D., Theory and Practice of Medicine.

JAMES H. ARMSBY, M. D., Descriptive and Surgical Anatomy.

JOHN V. P. QUACKENBUSH, M. D., Obstetrics and Diseases of Women and Children.

JACOB S. MOSHER, M. D., Chemistry and Medical Jurisprudence.

S. OAKLEY VANDERPOOL, M. D., General Pathology and Clinical Medicine.

JAMES E. POMFRET, M. D., Physiology.

J. V. LANSING, M. D., Materia Medica.

The Summer Course of Lectures in this College, commences in May and terminates in July. This course is FREE to Students and Medical men, and embraces topics which are discussed more fully than can be done in the regular term. It is believed that this course will render the summer studies of Students more profitable.

Catalogues with full information sent on application.

JACOB S. MOSHER, *Reg'r.*

FISKE MEDICAL PRIZE QUESTIONS.

The Trustees of the Fiske Fund, at the annual meeting of the Rhode Island Medical Society, held in Providence, June 10, 1868, gave notice that no awards had been made on the questions proposed by them the past year.

They offer the following subjects for 1868:—

1. *Bromides, their Physiological Effects and Therapeutical Uses.*
2. *Cerebro Spinal Meningitis, Pathology, and Treatment.*
3. *"Grave's Disease" (so called), Pathology and Treatment.*
4. *Carbolic Acid, its Therapeutical Effects, and Hygienic Uses.*

For the best dissertation on each of these subjects they offer a premium of one hundred dollars.

Every competitor for a premium is expected to conform to the following regulations, viz:—

To forward to the Secretary of the Fiske Fund Trustees, on or before the first day of May, 1869, free of all expense, a copy of his dissertation, with a motto written thereupon, and also accompanying a sealed packet, having the same motto inscribed upon the outside, and his name and place of residence within.

Previously to receiving the premium awarded, the author of the successful dissertation must transfer to the Trustees all his right, title, and interest in and to the same, for the use, benefit, and behoof of the Fiske Fund.

Letters accompanying the unsuccessful dissertations will be destroyed by the Trustees, unopened, and the dissertations may be procured by their respective authors, if application be made therefor within three months.

OTIS BULLOCK, M. D., Warren,	} Trustees.
J. W. C. ELY, M. D., Providence,	
GEO. L. COLLINS, M. D., Providence,	
S. AUG. ARNOLD, M. D., Providence,	

Secretary of Fiske Fund Trustees.

THE MEDICAL COLLEGE OF THE STATE OF SOUTH CAROLINA.

SESSION 1868-69. CHARLESTON, S. C.

REGULAR PROFESSORS.

J. E. HOLBROOK, M. D., Emeritus Professor of Anatomy.
 FRANCIS T. MILES, M. D., Professor of General Anatomy and Physiology.
 JULIAN J. CHISHOLM, M. D., Professor of Surgery.
 E. GEDDINGS, M. D., Professor of the Institutes and Practice of Medicine.
 J. P. CHAZAL, M. D., Professor of General Pathology, Pathological Anatomy and Hygiene.
 ROBT. A. KINLOCH, M. D., Professor of Materia Medica and Therapeutics.
 F. M. ROBERTSON, M. D., Professor of Obstetrics and Diseases of Women and Children.
 C. U. SHEPARD, M. D., LL. D., Professor of Chemistry.
 FRANCIS L. PARKER, M. D., Demonstrator of Anatomy and Lecturer on Special Anatomy.
 WM. H. BAILEY, M. D., Assistant Demonstrator of Anatomy.

SUPPLEMENTARY PROFESSORS.

FRANCIS L. PARKER, M. D., on Anatomy.
 WM. H. BAILEY, M. D., on Surgery.
 GEORGE E. TRESCOTT, M. D., on Therapeutics and will Examine on Practice.
 WM. F. ROBERTSON, M. D., on Obstetrics and Diseases of Women and Children.
 C. U. SHEPARD, JR., M. D., on Chemistry.

Clinical Lectures at the City Hospitals by the Regular Professors.

The Lectures in this Institution will be resumed on Monday, the 2d of November, 1868, and continued until the first Saturday in March, 1869. The morning hours, from 9 to 2 o'clock, will be occupied by the Lectures of the Regular Professors; the afternoons may be devoted to Dissections. The evenings will be taken up by the Supplementary Professors, in interrogating the Class on the Lectures of the Regular Professors, and original Lectures. These latter advantages, with the Clinical Lectures by the Regular Professors, will be enjoyed by the students without additional charge.

A Spring Course of Lectures will be delivered by the Supplementary Professors, of which due notice will be given.

Expenses of the School.

Matriculation Fee (paid once)	\$5 00
Entire Course of Lectures	105 00
Ticket for Dissection	10 00
Graduation Fee	30 00

The Fees for the Lectures will be required, in all cases, at the commencement of the Course.

F. M. ROBERTSON, M. D., *Dean.*

TO PHYSICIANS.

Prof. HORATIO R. STORER will deliver his fourth private course of twelve lectures on the

TREATMENT OF THE SURGICAL DISEASES OF WOMEN,

during the first fortnight of December, with illustrative operative instruction at the Franciscan Hospital for Women, under his charge.

Fee \$50, and Diploma required to be shown. Certificates of attendance upon the previous courses have now been issued to twenty-nine gentlemen in different parts of the country.

HOTEL PELHAM, BOSTON, June, 1868.

RUSH MEDICAL COLLEGE, CHICAGO, ILL.

FACULTY.

J. V. Z. BLANEY, A. M., M. D., Prof. of Chemistry.
 JOS. W. FREER, M. D., Prof. of Physiology and Microscopic Anatomy.
 J. ADAMS ALLEN, M. D., LL. D., Prof. of Principles and Practice of Medicine.
 E. INGALS, M. D. (Treasurer), Prof. of Materia Medica and Medical Jurisprudence.
 DeLASKIE MILLER, M. D. (Sec'y), Prof. of Obstetrics and Diseases of Women and Children.
 R. L. REA, M. D., Prof. of Anatomy.
 MOSES GUNN, A. M., M. D., Prof. of Principles and Practice of Surgery and Clinical Surgery.
 EDWIN POWELL, M. D., Professor of Surgical Anatomy and Military Surgery.
 JOSEPH P. ROSS, M. D., Prof. of Clinical Medicine and Diseases of the Chest.
 CHARLES T. PARKES, M. D., Demonstrator of Anatomy.
 WILLIAM LITTLE, M. D., Curator of the Museum.
 EDWARD L. HOLMES, M. D., Lecturer on Diseases of the Ear and Eye.
 CHARLES KEIL, Janitor.

The Twenty-sixth Annual Session will commence on the 30th day of September, and continue eighteen weeks. For the annual announcement or any information in reference to the College, address the Secretary, Prof. MILLER, 518 Wabash Avenue.

FEES.—Professors' Tickets	\$50
Matriculation	5
Hospitals	5
Graduation	25

THE WILLS OPHTHALMIC HOSPITAL,

Race Street, between Eighteenth and Nineteenth, Philadelphia.

A Course of Lectures and Practical Instruction in Ophthalmic Surgery will be given in the institution during the months of November and December.

The course will embrace the most important subjects of Ophthalmic Science, including the *Anatomy of the Eye*, the *Physiology of Vision*, *Ophthalmoscopic Diagnosis*, *Optical Defects of Vision*, and the *Pathology and Operative Surgery of the Eye*.

Instruction will be made demonstrative with abundant material for illustration, by dissections, models, drawings, and optical apparatus.

Attention will be given to the instruction of each member of the class in the practical use of the Ophthalmoscope.

The Operative Clinics of the Hospital will present an extended field for observing the operative surgery of the eye.

FEE TEN DOLLARS.

R. J. LEVIS, M. D.,

Surgeon to Wills Hospital, No. 1104 Arch Street.

NOTICE TO ADVERTISERS.

THE great increase in the circulation of the "AMERICAN JOURNAL OF THE MEDICAL SCIENCES" and the heavy cost of production render necessary an advance in the rate of advertising. A few advertisements connected with institutions of medical education will be inserted at the rate of TWENTY DOLLARS per page. As heretofore, none will be taken for less than Five Dollars, and as the space which can be devoted to the purpose is exceedingly limited and uncertain, advertisements must be sent at least three weeks before the appearance of the number in which insertion is desired.

THE
AMERICAN JOURNAL
OF THE MEDICAL SCIENCES
FOR OCTOBER 1868.

CONTRIBUTORS TO THIS VOLUME.

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 C. J. CLEBORNE, M. D., *Surgeon U. S. Navy.*
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 ISAAC HAYS, M. D., *formerly one of the Surgeons to Wills Hospital.*
 H. LENOX HODGE, M. D., *Attending Physician to Children's Hospital, Philadelphia.*
 E. HOLDEN, M. D., *of Newark, New Jersey.*
 JOHN HOMANS, M. D., *of Boston, Mass.*
 JAMES H. HUTCHINSON, M. D., *Physician to Pennsylvania Hospital.*
 W. KEMPSTER, M. D., *of Utica, New York.*
 A. F. A. KING, M. D., *of Washington, D. C.*
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 W. P. MOON, M. D., *of Philadelphia.*
 J. CHESTON MORRIS, M. D., *Physician to Episcopal Hospital, Philadelphia.*
 J. C. NOTT, M. D., *of New York.*
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 D. W. PRENTISS, M. D., *of Washington, D. C.*
 D. N. RANKIN, M. D., *Physician to Western Penitentiary of Pennsylvania.*
 ISAAC RAY, M. D., *of Philadelphia.*
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 W. E. WATERS, M. D., *Assistant Surgeon U. S. A.*
 WILLIAM L. WELLS, M. D., *of Philadelphia.*
 WM. R. WHITEHEAD, M. D., *of New York.*
 HORATIO C. WOOD, JR., M. D., *Professor of Botany in University of Pennsylvania.*
 JOSEPH WORSTER, M. D., *of New York.*
 JAMES T. YOUNG, M. D., *of Washington, D. C.*

TO READERS AND CORRESPONDENTS.

WANT of space has compelled us to postpone the insertion of several original articles and bibliographical notices prepared for this number.

All articles intended for the *Original Department* of this Journal must be contributed for publication to it *exclusively*. As original articles are accepted *only on this condition*, we consider those who favour us with contributions to be bound in honour to conform to it.

Contributors who wish their articles to appear in the next number, should forward them before the 1st of November.

Compensation is allowed for original articles and reviews, *except* when illustrations or extra copies are required. A limited number of extra copies will be furnished to authors, *if the request for them be made when the communication is sent*.

The following works have been received:—

On Asthma: its Pathology and Treatment. By HENRY HYDE SALTER, M. D., F. R. S., F. R. C. P., Phys. to Charing Cross Hospital, and Lecturer on Prin. and Prac. of Med. at Charing Cross Hospital Med. School. Second edition. London: John Churchill & Sons, 1868.

On the Action, Use, and Value of Oxygen in the Treatment of Various Diseases otherwise Incurable or very Intractable. By S. B. BIRCH, M. D., M. R. C. P. Lond., etc. etc. Second edition. London: John Churchill & Sons, 1868.

A Manual of the Pathology and Treatment of Ulcers and Cutaneous Diseases of the Lower Limbs. By JOHN KENT SPENDER, M. D. Lond., Surgeon to Mineral Water Hospital and to the Eastern Dispensary, Bath. London: John Churchill & Sons, 1868.

Miscellaneous Contributions to the Study of Pathology. By JOHN W. OGLE, M. D., Physician and Lecturer on Pathology, St. George's Hospital. (From the Author.)

On a Case of Death from Hemorrhage into the Pericardium, as a Result of Rupture of one of three true and circumscribed Aneurisms of the Coronary Artery of the Heart; with Observations on Aneurism or Aneurismal Dilatation as a Result of Embolism or Thrombosis. By J. W. OGLE, M. D., etc. (From the Author.)

Instances of some of the Rarer Varieties of Morbid Growths, Swellings, etc., connected with the Organs contained within the Abdominal Cavity. By J. W. OGLE, M. D., etc. (From the Author.)

Le Docteur au Village entretiens Familieres sur l'Hygiène. Par Mme. HIPPOLYTE MEUNIER. Paris: Libraire de L. Hachette et Cie., 1868. (From F. W. Christern, New York.)

On Diseases Peculiar to Women, including Displacements of the Uterus. By HUGH L. HODGE, M. D., Emeritus Prof. of Obstetrics and Diseases of Women and Children in the University of Pennsylvania. Second edition, revised and enlarged. Philadelphia: Henry C. Lea, 1868.

Atlas of Venereal Diseases. By A. CULLERIER, Surgeon to Hôpital du Midi, Member of Surgical Society of Paris, Chevalier of Légion d'Honneur, etc. Translated from the French, with Notes and Additions, by FREEMAN J. BUMSTEAD, M. D., Prof. of Venereal Diseases in College of Physicians and Surgeons, New York, etc. With about one hundred and fifty beautifully coloured figures, on twenty-six plates. Part 4. Philadelphia: Henry C. Lea, 1868.

The Science and Practice of Medicine. By WILLIAM AITKEN, M. D. Edin., Professor of Pathology in Army Medical School. Second American from the fifth enlarged and carefully revised London edition, adopting the new nomenclature of the Royal College

of Physicians of London. With large additions by MEREDITH CLYMER, M. D. Ex-Professor of Instit. and Practice of Medicine in University of New York, etc. etc. In two volumes, with a map, lithographic plate, and numerous illustrations on wood. Philadelphia: Lindsay & Blakiston, 1868.

A Theoretical and Practical Treatise on Midwifery, including the Diseases of Pregnancy and Parturition. By P. CAZEAUX, Adj. Prof. in Faculty of Med. of Paris, etc. etc. Adopted by Superior Council of Public Instruction. Revised and annotated by S. TARNIER, Adj. Prof. in Faculty of Med. of Paris, etc. etc. Fifth American from seventh French edition, by WM. R. BULLOCK, M. D. With one hundred and seventy-five illustrations. Philadelphia: Lindsay & Blakiston, 1868.

A Manual of Extracting Teeth. By ABRAHAM ROBERTSON, D. D. S., M. D., etc. Second edition. Philadelphia: Lindsay & Blakiston, 1868.

Diseases of Children: a Clinical Treatise based on Lectures delivered at the Hospital for Sick Children, London. By THOMAS HILLIER, M. D. Lond., F. R. C. P., Phys. to Hospital for Sick Children and to University College Hospital, London. Philadelphia: Lindsay & Blakiston, 1868.

The Physician's Visiting List for 1869. Philadelphia: Lindsay & Blakiston, 1868.

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ART. I.—*Practical Remarks on the Treatment of Urethral Stricture, with a Description of a Modification of Holt's Instrument.* By FREEMAN J. BUMSTEAD, M. D., Professor of Venereal Diseases at the College of Physicians and Surgeons, New York. (With ten wood-cuts.)

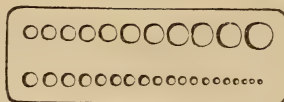
DURING the eight months elapsing between September 1, 1867, and May 1, 1868, thirty-three cases of urethral stricture came under my charge, either in private practice or in my venereal service at Charity Hospital, Blackwell's Island, and I propose to found upon these cases a few practical remarks derived from personal experience, more especially with regard to some of the more recent methods for the treatment of urethral contraction.

Of these cases, eight, in which the stricture was seated at or near the bulbous portion of the urethra, and in which the contraction was but moderate, were treated by simple dilatation with bougies and sounds in the usual manner, and all of them terminated favourably, the dilatation being continued to the largest-sized instrument which the urethra would admit.

With regard to the instruments employed in dilatation, it would be extremely desirable if a uniform scale of sizes could be generally adopted. At present the Astley Cooper gauge, known also as the English and American, is in common use here and in England. In France, two gauges are recognized, that of Charrière and another of Bénéqué. The Germans, I believe, employ sometimes the English and sometimes the French scale. The *Charrière-filière*, which is the one more generally employed in France, and which I shall refer to in the present paper as the "French scale," has divisions of one-third of a millimetre. It presents the advantages of a uniform scientific gradation and a more minute subdivision than obtains

in the American scale, and is worthy of being universally introduced. The highest number of this scale is 30; that is, an instrument with a diameter

Fig. 1.



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The French scale, division one-third of a millimetre.

of ten millimetres corresponding to about No. 18 of the American scale. The value of this and approximating high numbers in the treatment of stricture is very great, since their use contributes materially to the permanency of the cure.

In the catheter gauges in use in my own office, I have marked on the reverse of the plate the American numbers, as nearly as they can be made to approximate to the French. The correspondence of the two scales is as follows:—

French,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30.
American,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18.

The irregularity of the American scale is here apparent.

Béniqué's scale is still more minute than the above, being based on subdivisions of one-sixth of a millimetre, No. 10 corresponding to No. 5 of the *filière* Charrière, No. 30 to No. 15, No. 60 to No. 30, etc.; but such a degree of minuteness appears to be unnecessary.

For the lower numbers of the Charrière scale, say all below 14, it is better to employ gum-elastic bougies in place of metallic sounds, since the latter, from their small diameter, are liable to give rise to false passages.

An abundant supply of bougies of suitable size and shape is an important requisite of the surgeon's armamentarium, and its absence is, I am convinced, the source of much of the injury often inflicted upon patients. The mahogany-coloured bougies, so commonly found in surgical cases, at hospitals and elsewhere, are almost useless from their stiffness and the impossibility of their readily adapting themselves to the natural curves of the urethra. The black bougies of *gomme élastique* are far preferable, their only disadvantage being the care required to keep them in good order, in consequence of their greater friability and their tendency to stick together in warm weather. The latter objection is effectually removed by occasionally dusting them with powdered soapstone, arrowroot, lycopodium, flour, or other similar powder.

The advantage of conical bougies with olive-shaped points, although long known, is not so universally appreciated as it should be, as evinced by the fact that these instruments have several times within the last year or two been brought forward as new. The bluntness of their points, which

prevents their engaging in the lacunæ of the canal, and the flexibility of the constricted neck, which facilitates their adaptation to the urethral curves, render their introduction both easy and safe even in the most inexperienced hands; and, again, the conical shape of the shaft materially promotes the process of dilatation. This form of bougie cannot be too highly recommended, especially to those who have had only a limited experience in the use of urethral instruments.

Catheters made upon the same principle, with conical extremities and bulbous points (Fig. 2), are admirably adapted to cases of retention of

Fig. 2.



urine dependent upon the enlarged prostate of old age or prostatitis, or upon ordinary organic or spasmodic stricture, if passable by anything larger than a filiform bougie.

The French "*bougies à boule*" afford the only means available (aside from the endoscope) of detecting slight urethral contractions upon which the persistence of chronic gonorrhœa or a gleet often depends. They are also of great value in determining the length of strictures, as well as the

Fig. 3.



Acorn-pointed bougie.

presence of a second contraction beyond the one first met with. The term "*à boule*" is inappropriate, since the point should not be spherical or olive-shaped, but rather be furnished with an abrupt shoulder, which affords the greatest delicacy to the touch in passing slight contractions. I have been in the habit of calling them "acorn-pointed bougies" (Fig. 3). Different sizes are, of course, requisite.

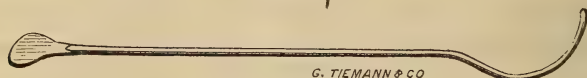
"Filiform bougies," the point of which is even smaller than one-third of a millimetre in diameter (No. 1 of the French scale), are indispensable in the treatment of tight strictures. The absurdity of the American scale is shown by the fact that its smallest number measures two and one-third millimetres, or seven times the diameter of the bougies referred to. Hence, the surgeon provided only with instruments corresponding to the American scale will find many "impassable" strictures which can readily be passed with smaller instruments, and, in cases of retention of urine, will be tempted to resort to uncalled-for violence or to puncture of the bladder. In the great majority of cases referred to me as "impassable" strictures by physicians in general practice, the first trial of a filiform bougie is found to surmount the obstacle.

The best French bougies are those made by Lasserre, No. 5 Av. Victoria,

Paris. Those sold by Weiss, in London, are superior in that they are not so adhesive, but they are much more costly.

From Nos. 14 to 30 inclusive, instruments either of steel, block tin, or fusible metal may be employed, and possess the advantage of their surface not yielding and becoming indented in the presence of a firm stricture. The curve, or rather double curve, known as Béniqué's (Fig. 4), the anterior curvature corresponding to the natural curve of the urethra at the peno-scrotal angle when the penis is in a flaccid condition, is a very

Fig. 4.



Béniqué's curve.

desirable one, especially with deeply-seated strictures. The extremity of the instrument should taper off for an inch and a half to two inches, so that its point may be two sizes smaller than the main body of the shaft. Thus the point will readily enter a stricture through which the next smaller size has already been passed, and we obtain the advantage of the principle of the wedge in promoting and hastening dilatation. The same plan enables us to dispense with the sounds of every other number in the construction of portable cases of small bulk.

Twenty-five of the thirty-three cases of stricture referred to at the commencement of this article were treated by rupture or by urethrotomy, either internal or external. This may seem a large proportion, but is not an unjustifiable one, in my own opinion. During the first eleven years of my practice I employed simple dilatation almost exclusively, except in the small proportion of cases in which, from the presence of perineal fistulæ, or other causes, perineal section was absolutely requisite. Subsequently I was led to make a thorough trial of Holt's method, and of the urethrotomes of Maisonneuve and others; and now, after five years' further experience, I feel fully convinced that the immediate treatment of stricture either by incision or rupture, is not only as safe as that by dilatation, but that it saves much valuable time, and that its results are more permanent and satisfactory. Instead of weeks, or even months, devoted to the repeated introduction of instruments, which cannot be said to be free from danger, the stricture is removed at one sitting with an amount of risk which I believe is even less than the aggregate of that incurred in dilatation; and the tendency to relapse is by no means so marked. Entertaining this opinion, I cannot but regard the opposition to operative procedures in cases of stricture as unfounded; and especially do I deem it unfortunate that the statement, which is said to have emanated from eminent surgeons, should have found its way into print, to the effect that strictures can as

well, or better, be treated by rest in bed and low diet alone, as by any other method.

Of the twenty-five cases of stricture referred to, there were treated—

- I. Five by Civiale's larger or smaller urethrotome.
- II. Three (ruptured) by Holt's instrument.
- III. Eleven by Maisonneuve's urethrotome.
- IV. One by Holt, and subsequently by Maisonneuve.
- V. Two by Gouley's urethrotome.
- VI. One (ruptured) by Thebaud's instrument.
- VII. Two by perineal section.

It is not necessary for my present purpose to enter into the details of these cases. With the exception of five, the stricture or strictures were situated at least as far back as the peno-scrotal angle, and most of them in the bulbous portion of the urethra; the majority of them were old and neglected cases, in which at the outset only a filiform bougie could be passed, and none had a capacity greater than No. 9 French (No. 3 American).

I propose to speak of the instruments employed, and, of the many that have been invented, those most worthy of the confidence of the surgeon. The manner of using the instruments will also be considered. The immediate result, with a slight exception (one of abscess, to be hereafter mentioned), was all that could be desired. As most of the cases have passed from under my observation, I cannot of course testify as to the permanence of the cure, but I am still able to draw general conclusions from a portion of these and from other cases of older date occurring in private practice.

Civiale's Instruments.—These were employed in five cases in which the stricture was seated either at the meatus or within an inch and a half of the urethral orifice. Civiale's larger urethrotome (Fig. 5), which is straight, is

Fig. 5.

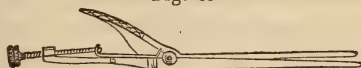


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Civiale's larger urethrotome, cutting from behind forwards.

especially adapted to contractions of the spongy portions of the canal; but in consequence of the size of the terminal bulb, cannot be employed in tight strictures without the preliminary use of some other instrument.

Fig. 6.



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Civiale's *bistouri caché*.

Civiale's concealed bistouri (Fig. 6) is admirably adapted for the division of

strictures at and near the meatus. In one of the above cases, a stricture at the meatus was so contracted as only to admit the finest of Anel's probes, and in order to enlarge it sufficiently to pass the *bistouri cachê*, I first divided it with the minute probe-pointed knife, which is commonly employed for slitting up the canaliculi of the eyelids.

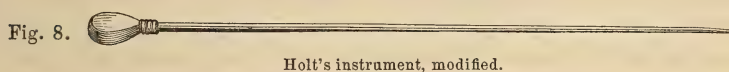
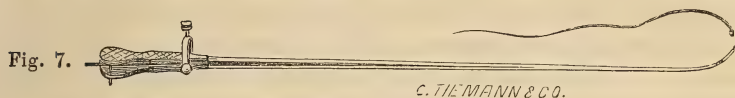
Holt's Instrument.—Holt's instrument for the rupture of stricture is now well known to the profession, and has acquired wide and deserved celebrity. My first trial of it was about five years ago, and I have now used it in upwards of thirty cases, in most of which it has proved highly satisfactory, and in none of which has there been any more serious consequence than moderate urethral fever, which has yielded to the hot bath and the exhibition of opium and quinia internally.

At the same time, it has been evident that the instrument, as originally proposed by Mr. Holt, possessed certain defects, and could be modified to advantage.

Others, as well as myself, soon discovered that the expansive power of the instrument was insufficient; that even when the largest tube was employed, there were some strictures which would merely stretch as it passed without being ruptured, and would afterwards tend strongly to return to their former condition. The remedy for this was evident, viz., to allow wider separation of the blades and employ larger tubes. This modification has sufficed for the purpose in most cases, although not in all. In one of the above twenty-five cases I employed the largest sized tube, with the immediate effect of being able to introduce No. 23 (French) sound, but, at the end of forty-eight hours, No. 17 was still firmly "held" by the stricture, situated at the bulb, when I had recourse to internal division with Maisonneuve's urethrotome, and no tendency to recontraction has appeared up to the present time—five months since the operation—the patient still continuing his visits for the purpose of observation.

But there was still another objection to Holt's instrument. The size of its point, which equalled No. 7 of the French scale, or No. 1 American, rendered it impossible to use the instrument in very narrow strictures until, by the successive introduction of filiform bougies, the requisite calibre had been attained; and even then the curve of the instrument was such that its insertion was not always an easy matter. Thus, after dilating the stricture with bougies up to No. 7 (French), I often found considerable difficulty in introducing a Holt, especially as the shaft of the instrument rapidly increases in diameter, so that practically a much greater degree of dilatation than No. 7 is required for its insertion to such an extent within and beyond the contraction as to enable us to use it for the purpose intended. This is evident on inspecting the instrument, which will be found to require a calibre of No. 11 (three and two-thirds millimetres = No. 4 American scale) in order that the introduction of either of the tubes along the central wire may have any effect upon the stricture.

To obviate this difficulty, Mr. Stohlmann, of the firm of Messrs. Tiemann & Co., at my request, changed the curve of the instrument, so that it should correspond to what is known as Thompson's curve. I also directed that the point should be made separate, so that it could be unscrewed, and in its place a filiform bougie could be attached (Fig. 7)



which should possess all the advantages of the conducting bougie of Maisonneuve's urethrotome, and enable me, with a little time and patience, to insert the instrument to the requisite extent in any case of stricture which was at all passable, and at a single session. Again, the central wire is made hollow, and in fact consists of a tube, the vesical opening of which terminates near the extremity of the instrument, anterior to the screw point, so that the flow of urine may indicate when the bladder has been entered. This, however, is a minor consideration with the bougie attachment, since any deviation from the proper course is now almost impossible. These modifications have been found to accomplish all that was desired, and will, I believe, materially increase the value of Mr. Holt's instrument.

I would add that the same bougies may be made to fit on to both Holt and Maisonneuve, so that the choice of the instrument need not necessarily be determined until after the conductor has been passed.

Thebaud's Instrument.—The instrument for the rupture of strictures, invented by my friend, Dr. Julius S. Thebaud, of this city, has not, I believe, been before described. In shape it corresponds to an ordinary sound, but the extremity of the instrument is split horizontally for a distance of about five inches, forming two blades, which are separated in a vertical direction by turning a screw in the handle (Fig. 9). There are

Fig. 9.



Thebaud's instrument for rupture.

two sizes; the point of the smaller has a diameter of four millimetres (No. 12 of the French scale); that of the larger, one of six and two-thirds millimetres (No. 20 of the French scale); hence it is evident that the

instrument cannot be used in tight strictures without preliminary dilatation or incision. In using the instrument, the extremity is passed fairly through the stricture, when the screw at the handle is turned until the contraction is felt to "give," or the desired amount of dilatation is effected, as indicated by a scale marked on the screw shaft.

This instrument is one of very great power and capacity. The larger one is capable of rupturing a stricture to a size much exceeding No. 30 of the French scale (No. 18 American). By measurement this power equals a sound of five-eighths of an inch in diameter. Compared with Holt, Thebaud's instrument has therefore the advantage of any desirable amount of dilating and rupturing power, and the disadvantage of not being adapted to tight strictures. This extreme power may render its use dangerous in unskilful hands; and there is the further objection that it requires some care to determine when the stricture is accurately caught to its full extent near the point of the instrument. Still, it is remarkable with what impunity the urethral walls will bear the apparent amount of violence which this instrument can exercise. I have used it in some fifteen to twenty cases, and Dr. Thebaud himself in about double the number, without unpleasant consequences. In one of those rare cases of pure spasmodic stricture which we sometimes meet with, I assisted Dr. Thebaud in introducing his larger instrument into the membranous portion of the urethra, and opening the blades to their fullest extent. The operation was performed on the same principle as leads us to rupture the sphincter ani in irritable conditions of the lower portion of the rectum. The tissues were felt to suddenly yield, doubtless in consequence of their rupture, but there was no subsequent chill, fever, undue hemorrhage, incontinence of urine, or other unpleasant consequence, and the patient was about attending to his business the following day. The spasmodic action was entirely relieved for over a year, but, as I have learned, subsequently returned. For a case of this kind no other instrument that I know of would have served the purpose.

I have found Thebaud's instrument of special value in cases like one before mentioned, in which the stricture had not been sufficiently ruptured by the use of Holt.

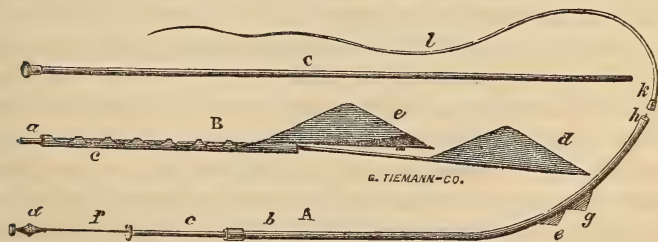
Before leaving the subject of instruments intended for the rupture of stricture, it is proper to refer to Mr. Thompson's instrument, although its inventor designed it rather for the rapid dilatation than actual rupture of the constricting band. I have not as yet made use of this instrument, but the principle of it is excellent, and I should judge it to be of great value whenever a timid patient refuses to submit to what appears to him a more violent procedure. It is evident that the dilatation may be carried to the point of rupture, and thus the same effect be produced as with either of the above named instruments.

Maisonneuve's Urethrotome.—This instrument is now too well known

to require description, and the reader of our current medical literature must have observed the numerous favourable notices of it, emanating from various sources, which have appeared during the last few years. In my own opinion, it is by all odds the simplest and the best urethrotome ever invented. Its filiform attachment enables it to be used in every stricture, however tight, through which the finest bougie can be passed; the bluntness of the apex of its triangular-shaped blades is well adapted to prevent any sound portion of the canal being wounded; and its simplicity renders it easily cleansed, and little liable to get out of order.

I desire to call attention especially to the first of these advantages, which is also shared by my own modification of Holt, as before described. A patient comes to your office with what appears at first to be an impassable stricture. After a while, however, you succeed in engaging the point of the filiform extremity of one of Maisonneuve's bougies within the contraction. Your patient is allowed to remain for half an hour, when the bougie will enter still further, and thus by the process of what has been called continuous dilatation, the apparently impassable stricture is soon enlarged sufficiently for the full and free passage of the fine bougie. This is now screwed to the end of the metallic shaft of Maisonneuve or Holt, which by the aid of one finger in the rectum may now be guided into the bladder, within which the bougie-conductor coils itself up as the shaft advances. It remains only to thrust down the knife or tube, as the case may be, and your patient is relieved of his stricture before leaving your office. This may seem to be making light of a serious operation, but it is what I have often done, especially with patients from a distance, whose stay in the city was necessarily limited. A hackney coach may be called to take the patient to his lodgings, and twenty-four hours' quiet in his room is usually sufficient.

Fig. 10.



MAISONNEUVE'S URETHROTOME, MODIFIED BY VOILEMIER. — *A. g*, the triangular knife, sharp throughout; *e*, shield with blunt edges; *l*, filiform bougie. *B*. Knife and shield of full size. *C*. Flexible catheter, which can be screwed upon the filiform bougie, after withdrawal of the urethrotome.

One word as to the possibility of Maisonneuve's instrument wounding those portions of the urethra which are not contracted. I have had no reason to believe from my own experience that this ever occurred, but I have recently heard of a case, how true I do not know, in which the pa-

tient died of cholera two days after the operation, and at the post-mortem examination, the mucous membrane of the urethra is said to have been found "incised from the meatus to the bladder." If this case is authentic, I feel confident that the instrument itself was at fault, but any danger of this kind can be effectually removed by adopting Voillemier's modification, which consists of a shield that protects the blade until an obstruction is felt, when the shield is retracted, and the knife, which is made sharp at the apex, is pushed forward, and is again covered by the shield as soon as the stricture is divided.

With regard to the pain inflicted in either of these operations, by Holt or Maisonneuve, it is not severe, and except with very timid patients does not require the use of an anæsthetic. It has seemed to me to be decidedly greater with rupture than with urethrotomy. In cases of the latter, it is not unusual for the patient, surprised at the completion of the operation, to inquire, "Is that all?"

The treatment of the patient subsequent to the operation is of importance, and I have endeavoured in my own cases to interfere as little as possible with the parts for the first few days, believing as I do that we were formerly inclined to interfere altogether too much. Either before the operation or immediately after the withdrawal of the urethrotome or rupture instrument, I make it a point to divide the meatus, unless it is naturally of a large size, either with a knife or Civiale's *bistouri caché*. This is essential for the subsequent employment of sounds of sufficient size to fully distend the canal and to secure all that has been gained by the operation. Before leaving the patient a careful exploration of the canal may be made, if the surgeon so chooses, but it is not necessary, and if there is more than a small flow of blood, or if the sound appears to catch in the wound, it is positively contraindicated.

It is indeed satisfactory, and adds to the brilliancy of the operation to slip in a No. 26 or 28 sound through a canal which just before admitted only No. 1. But what is gained for the patient thereby? We have felt the stricture give on the passage of the rupture tube, or we have seen the stem of the urethrotome disappear until the knife must have entered the bladder, and we *know* that there is now a pretty free opening into that viscus. Any interference with the wound can do no good, and may produce irritation or favour hemorrhage. If, possibly, the natural calibre of the urethra has not been quite completely restored, we shall discover the fact two days after on using the sound, and the operation is so simple that it may be repeated if necessary, or another instrument of greater efficacy, as Theband's or Civiale's, be then employed.

Again, with regard to leaving an instrument in the canal after the operation, my own course differs from that of many authorities. Maisonneuve, I believe, especially insists on a catheter being retained for twenty-four hours after the use of his instrument, until the edges of the wound are

"glazed over with lymph," so as to lessen the danger of urethral fever. I have never resorted to this course after rupture or internal urethrotomy, and the omission has not been productive of any evil consequences. If the patient has not evacuated his bladder a short time before the operation, the urine may be drawn off by a small flexible catheter adapted to screw on to the conducting bougie before the latter is withdrawn from the canal (*cathétérisme à la suite*). A suppository containing a quarter of a grain of morphia is now to be inserted within the anus; the internal administration for a few times of a grain of the sulphate of quinia and ten drops of laudanum, as recommended by Holt, every four hours, is desirable; the patient should be directed to abstain from passing his urine as long as possible, and keep quiet at home until the following day, after which, if nothing untoward has occurred, his liberty may gradually be increased.

The end of forty-eight hours is early enough to pass a full-sized sound in order to maintain the patency of the canal. This should be repeated every second or third day for ten days or a fortnight, after which two or three insertions at intervals of a week are desirable, and if the patient live at a distance, he may be taught to use the sound himself. More frequent insertion of instruments is likely to do harm; and, indeed, in view of my former belief and practice in this respect, I have been surprised to find how little was absolutely required. One of my patients the past winter was an immense, stalwart, but very timid German, who had a very tight stricture, and would only consent to be operated upon under ether. I employed Maisonneuve's urethrotome, and as the flow of blood following was a little free, I did not pass a sound after the operation. Upon proposing to do so two days afterwards, the man absolutely refused to have it done, saying that he could make a better stream than any other man in the ward. Partly for the sake of experiment, I consented to let him alone. He remained in the hospital for six weeks, and I satisfied myself by actual observation at the time of his leaving that his stream of urine had not diminished, although no instrument whatever had been passed since the operation.

At the same time, I am not over-sanguine with regard to the permanence of the cure after any mode of treatment, in the absence of prolonged attention. It is true that I have still patients under observation, operated upon four or five years ago, in whom there is no tendency to relapse, as shown by the size of the stream and the freedom with which a sound may be passed. But from what we know of the pathological anatomy of strictures, and from the evidence afforded by casts of the canal some time after the passage has been freely opened, it is evident that the tissue of new formation does not entirely disappear even on the supposition that it is materially diminished. Moreover, cases will return to disappoint us when we had hoped for better things. I am to operate on a case again to-morrow in which I divided two strictures with Maisonneuve last October—one seated about three-fourths of an inch from the meatus, the other in the

sub-pubic curvature. The patient's meatus was small, and I carelessly omitted to slit it up. He lived at a distance, and was unwilling to pass the sound himself. Although I have seen him about once a month since, and passed instruments, yet the tendency to contract is so marked that it is evident another operation is required. I look upon division of the meatus, and the subsequent use of the largest practicable sounds (rarely less than 27) following the operation, as affording the greatest attainable security; but still every man who has had a stricture should be cautioned to keep himself under the observation of his surgeon for a year or longer, and never forget the possibility of a relapse.

In expressing the opinion that the immediate treatment of stricture, whether by rupture or internal division, was safe, I have been fully aware of the accidents that have been reported. Death has been caused by the use of Holt's instrument, but it has also been produced by the simple passage of a catheter. A safe operation is understood to be one comparatively so. A man with a stricture runs less risk in having it treated than in letting it alone, and, of the different modes of treatment, I believe that rupture and internal urethrotomy are as safe, if not safer, than any other. Neither in the cases which form the text of this paper, nor in the many others of which I have unfortunately kept no full record, have I met with any serious accident. The only decidedly disagreeable consequence was the formation of an abscess at the peno-scrotal angle in a patient operated on at the hospital, and this occurred ten days after the operation, and followed the somewhat violent introduction of a sound by one of the house staff. The abscess closed kindly without leaving a fistula after being opened, and the patency of the canal was not impaired.

I have thus far expressed no preference between the different operations and instruments alluded to. To be wedded to one exclusively, would appear to be as senseless as for a surgeon to decide to use but one form of knife or scissors in all his operations. *A priori* reasons would lead us to prefer urethrotomy in the anterior portions of the urethra, where strictures are firmer, and where hemorrhage and other accidents are less likely to occur, or, if occurring, are more readily controlled; the contrary conditions would favour rupture in the sub-pubic curvature; at the same time I have practically found internal division perfectly satisfactory in the latter region, as performed by Maisonneuve's instrument.

I have been led to make the present communication partly from a desire to put on record some opinions contrary to those which I formerly expressed (*Pathology and Treatment of Venereal Diseases*), and also from the conviction that if those enjoying a field for observation in any specialty would oftener make known the standpoint at which they have arrived, and entertain less fear of being called inconsistent even if time and experience have changed or should change their views, our art would be the gainer.

ART. II.—*An Examination into the Truth of the Asserted Production of General Diseases by Organized Entities.* By HORATIO C. WOOD, Jr., M. D., Professor of Botany in the University of Pennsylvania.

OF the many subjects which claim the attention of the medical inquirer, there are few the importance of which is greater than that of the causes of disease. It seems both natural and philosophical to believe that disease is not an inherent necessity of the organism; that the physical machinery of the system was so constructed originally that it should, under proper conditions, run smoothly through its allotted period, and gradually wear out, falling to pieces at last almost as did the century chaise of our New England poet. Unfortunately, however, every one well knows how few die thus in ripe old age. The sources to which disease can be traced in our modern life are legion: over-work, over-excitement, alcohol in some of its forms, gluttony, and a host of other evident causes of disease are but too apparent.

There are, however, numerous affections, the sources of which are not so evident. Most of the serious, acute, general diseases may be readily traced back to the introduction of a poison into the blood, but the exact nature of such poisons is still an open question. The greater number of such diseases may be grouped for study under two heads, namely, the epidemic and contagious; the one comprising those in which the poison, although giving origin to a definite train of symptoms, does not in so doing undergo increase; the other, those in which it is increased during the morbid processes established, so that the mere speck of contagium gives origin to an infinitude of particles endowed like itself. Malarial intermittent may be taken as the type of the former, smallpox as that of the latter class. In each of these cases the poison is apparently material. What then is its nature? Is it organic or inorganic? The connection between organic matter and the virus of smallpox or the poison of malaria is so close as to render very improbable any hypothesis which considers such morbid poisons as inorganic in their nature. If they be then organic, are they organized entities, or are they organic principles, or simply states of some living unorganized matter, or, to place the question in the form in which it is to be looked at in this essay, are the poisons of contagious and epidemic disease organized entities, or simply organic?

The idea that these poisons are living organisms is not a new one. The opinion that the deleterious nature of malarial air was owing to the presence of animalcula dates back at least to the days of Lucretius and Varro. It was revived and warmly upheld in modern times by the great Linnæus, who wrote a work in its favour.

Following this greater light, numerous lesser ones have attempted to establish and illuminate this theory. Most curious and quaint are some

of the passages in their works, as an example of which may be cited the following from Dr. Adam Neale's "*Researches to Establish the Truth of the Linnæan Doctrine of Animate Contagion.*"

"During the Pontificate of Clement VI. a cruel pestilence raged, which destroyed two-thirds of the human race. Villanius, the historian, says, also, that it commenced in Upper Asia, in Cathay, in 1346, from a most filthy smelling vapour, supposed to proceed from a certain fiery body, which either fell down from the atmosphere or was eructated from the earth; that this vapour, like a fire, consumed all that stood in its way, animals, houses, trees, etc., for the space of fifteen days' journey all round, and most filthy little beasts furnished with feet and tails, and a small sort of snake in a numberless multitude fell at the same time from the atmosphere upon the earth, the stench and putrefaction from which infected the very air and all the region round."

Dr. N. afterwards gravely states the "filthy beasts" were most probably "the larvæ of *Eristalis tenax*." An irrefragable proof of his theory!

Even the microscope has been appealed to, and Whitehead tells us to add water to pus until the globules burst, and says, upon the authority of Bourguignon, "if the attention remain fixed for a time upon the objects, a multitude of animalcules will be seen moving in the field of the microscope."

The discovery of the itch insect strongly confirmed this animalcular theory, and, indeed, seems to have been thought by many fully to establish it. One writer of the period states that he believes the Scottish skin disease, *sivvens*, to be a hybrid between syphilis and the itch, that the male of the syphilis insect copulating with the female itch insect produces an animal, which gives rise to a disease in which both of its ancestors' lineaments are discernible.¹

This animalcular theory is even still held by at least one very respectable medical writer, and has been taught within a few years by some of the ablest medical teachers of the country, otherwise it would seem hardly worth while to attempt its confutation. Combating it is like striking at a shadow. No one now professes to have seen these pestilential creatures, and, indeed, the only argument in favour of their existence worthy of consideration, is the reputed fact of the travelling of the cholera poison against the wind, which is said to necessitate the possession of the power of locomotion by the poison. How, then, are the various contagiums carried from point to point? Evidently simply by the power the air has of floating little masses of matter.

The dispersion of composite and other seeds; the curling smoke; the begrimmed houses of a Manchester or a Pittsburg; the dust storms in mid-ocean; the clouds of pine-pollen miles away from the forests which produced them; the dust everywhere, in which the microscopist finds almost everything represented; all these are familiar proofs of the existence of such power. It is worthy of remark, that no solid non-volatile particles

¹ See Adams "On Morbid Poisons," p. 179.

are known, whether inorganic or organic, or vitalized organisms, which have the power of actively dispersing themselves in the air. All, so far as known, are either raised into it and scattered, in accordance with ordinary physical laws, or are lifted up, as it were, by some volatile substance with which they are combined; as, for instance, the heavy particles of the carbonate of lead, in a newly-painted room, by the volatile spirit of turpentine with which they are associated.

If the asserted travelling of cholera alluded to be true, it seems necessary to account for it by supposing it to be caused by very high currents in the atmosphere running counter to those at the surface of the ocean.

Hundreds of observers have been carefully examining for many years vaccine and other viruses, cholera stools, &c., and have failed to find the contagion-animalcule. More than this, as above stated, no animalcule endowed with the requisite motor powers is known. If such a creature were a possibility, it would have to be formed upon an entirely new *type of structure*, and would constitute a distinct class or order of itself. All known protozoa move either in virtue of vibrating cilia or flagella, or by means of the alternate contraction and expansion of the whole or of a portion of their bodies.

The former of these means of progression requires a dense resisting medium like water: the second a fixed surface or some fixed points, to which the advancing part may cling. To imagine a protozoon, with wings wide-spread, and pectoral muscles in vigorous action, certainly requires a considerable effort. For similar reasons to these the animalcular theory is now generally abandoned as untenable, but it is worthy to be noted that it is *negative evidence* which has overthrown it.

Judging from the current literature, there is at present in the professional mind a strong tendency to assign as the cause of various diseases, the entrance into the blood of protophytes or low plants. Amongst the affections believed to have such origin are the various intermittents; and, when one looks at the positions whence malaria comes forth and the conditions necessary to its generation, the probabilities of its having a vegetable origin certainly appear very strong. The sequence of the symptoms, and the entire natural history of miasmatic diseases are so diverse from those of other affections and at the same time so similar in all their varieties, that it would seem as though there must be a common cause—a cause, too, essentially different in its nature from that of the exanthemata. The favourite haunts of the malarial poison are swamps; the half-drained marsh; the alluvial bottom, with its deep mould soil, &c.; and because in such places various low algæ flourish, the idea has very naturally arisen that they are the excipients of intermittents.

On few medical subjects has there been more loose, illogical writing than upon this. As an instance, it is allowable here to quote a passage

from Dr. Morris' work on the Germinal Matter Poisons (p. 83), a book which in most other points is carefully and logically written.

"Thus attributing, as is now generally done, ague and the other malarious fevers to fungi or confervoid plants, like the palmellæ, whose little spores, we might perhaps say whose little selves, rise into the air in enormous numbers with the watery vapour, when the sun acts upon the marshy soil, or malarious silt at a certain stage of desiccation, the malaria, the bad air, being simply air in which these are more or less diffused. . . It would seem that these spores, as they exist in the most deadly malaria, grow, and that with great rapidity, on the membrane of the capillaries of the air-cell, passing from time to time into the blood. This theory of ague gets rid, in great part, of a puzzle of antiquity—the cause of periodicity of ague, which is brought under the known laws of the periodicity of vegetable development. A little explanation is here necessary. Philosophical botanists tell us that plants, with all their exquisite variety of leaf and flower, consist merely of the axis and the appendage of the axis. The simplest means are thus made to attain results of surpassing beauty. The plan of the vegetable is alternate free and restricted cell-development. This law extends to the lowest forms. Those plants which are mere cells do not develop uniformly, but with alternations of free and restricted growth, and this is so, quite independent of light or darkness, damp or drought, heat or cold. So that when we find the symptoms of ague to be intermittent, and contrast them with the continuous development of the germinal-matter diseases, we have confirmatory evidence of vegetable causation. Fortunately for the human race, *quinine*, while harmless to man, is *fatal to those minute organisms*." (pp. 83, 84.)

Under the apology of "it would seem," the fact is here asserted that these spores grow upon the membrane of the capillaries of the air-cells of the lungs and pass from time to time into the blood. Does Dr. M. mean to assert that *he himself* has so seen them? The context and mode of expression certainly answer no. Where, then, is his authority? Numerous microscopists have studied the pigment matter in malarial blood, why have they not seen the spores? Such assertions, made without giving the personal or other authority, cannot be too strongly reprobated. Again, that "the plan of the vegetable is alternate free and restricted cell-development" seems very much like philosophical nonsense. I have studied pretty extensively the life history of these low plants both as detailed in books and as they live and grow in nature, and feel warranted in asserting most positively that there is nothing known in the natural history of these protophytes that in any way is capable of throwing light on the "puzzle of antiquity." On first reading of the antagonism between quinia and these low plants, there were growing, in the window near by, three species of palmellæ. Masses of these were placed in a solution of the sulphate of quinia of the strength of one grain and a half to the ounce. After the lapse of some weeks, no difference is perceptible in the vigour of their growth, and in that of those in a vessel of simple water near them, all of the plants are in a very healthy state; the quinia has apparently exerted no influence whatever upon them.

A very elaborate attempt to prove that palmellæ are the essence of malaria, is that of Prof. Salisbury in the January number of this Journal for 1866. His results may be summed up in a comparatively few words: on exa-

mining the salivary secretions of those labouring under intermittent fever, he finds among a great variety of "zoosporoid cells, animalcular bodies, diatoms, dismidia (*sic.*), algoid cells and filaments, and fungoid spores," constantly in "great abundance, minute oblong cells, either single or aggregated, consisting of a smooth cell-wall, with a highly clear, apparently empty space between the outside cell-wall and nucleus," which he concludes from their appearance are not fungoid, but cells of an algoid type, resembling strongly those of the palmellæ. He satisfies himself that these minute cells were the only forms found that could be relied upon as constantly present in malarial levels and not present above them. He looks for these in various ague localities, and finds them, apparently, in every case; of this he gives a large number of instances.

Finally, as the *experimentum crucis*, he digs up a mass of bog earth on which the plants are growing, and placing this where certain persons will be exposed to its effluvia, finds that they take intermittent fever, and hence reasons that the cryptogam is the cause.

Putting the most liberal construction on these results, they simply prove that certain palmellæ grow on wet damp soils, such as exist wherever malaria is found, and that in the soil somewhere is the poison. Both well-known facts. What is wanted, is proof that the *plant* will produce the disease, not the *plant and soil together*. If Dr. S. will grow the palmellæ, removed from the bog earth, and with their progeny induce intermittents, then, and not till then, will he have demonstrated what he seeks to prove. Is it conceivable, remembering that diffusion takes place simply by mechanical means, that these minute bodies should extend upward only to a certain height, the "summit ague line," "whereas diatoms" (large siliceous organisms), "dismidia (*sic.*), fungoid spores, and animalcular bodies" are found in greater or less abundance above this line? Prof. S.'s descriptions of his genera and species are so vague and destitute of character that it is impossible to settle the question of identity or to make any approach thereto; but I can state that Prof. Leidy has slept for months with various species of palmellæ growing in masses near his bed, and that I myself have lived with them and swallowed them, purposely and by accident, by thousands, and yet in neither case has any trace of intermittent made its appearance, although the writer had a few years since eight or ten separate attacks of malarial disease, and therefore may be considered susceptible.

For these reasons, it does not seem unreasonable to demand, before giving our assent to Prof. Salisbury's theory, first, confirmation of his experiments; second, some proof that the plant by *itself* is capable of producing malaria.

There are various points in the life history of the palmellæ which make it almost impossible that they constitute malaria, or at least render it so very improbable as to require the most positive proof before it can be

accepted. None of the palmellæ are known to be parasitic in the proper sense of the term. Unlike the fungi, they do not grow in situations where the light does not have access to them. The reasons for these two facts are obvious: a fungus feeds on organic matter, and is consequently fitted to be a parasite, and is independent of light; whilst the palmella, feeding only on inorganic matters, has to decompose and recombine these into organic compounds by means of its chlorophyllous protoplasm. This it can only effect by the aid of light. How could such plants flourish in the interior of the body?

Again, frost lays a heavy hand upon malaria. Yet of all known organisms the palmellæ are pre-eminent amongst those over which extremes of heat and cold have little influence. I have specimens which grew in water of a temperature from 130 to 160° F. On the other hand, freezing appears to have no effect on them. I have often seen them living and apparently growing in the centre of icicles on the rocks. There are now in very active life in my window various species of palmellæ which have alternately been frozen and thawed a number of times during the past winter. The bloody snow of the old Arctic navigators is a familiar example of their hardihood; the red colour, it is well known, being caused by the presence, in very active, growing life, of a species of palmellæ.

Further, vegetable decomposition is an acknowledged necessity for the generation of malaria. Not so in the growth of palmellæ—they are independent of it. They grow everywhere, in the mountain, on the plain, *in the city*, in the bog; wherever moisture and light are, there may they be found. Their *presence* in malarial districts is a simple necessity of their laws of growth; their *absence* would be a startling circumstance.

In view of the total absence of any proof of genetic connection between palmellæ and malaria, the above given reasons seem sufficient to establish the fact that there is no such relation.

The life history of the fungi is so diverse from that of the palmellæ that many of the arguments just given do not apply to the proposition that certain fungi are the causes of intermittents. Thus they will grow in the dark, and they do not resist the action of cold to such an extent as the algæ. Nevertheless there seems to be enough evidence to exculpate them from the charge of constituting the various blood poisons. In the first place the supposition that they are the essence of malaria is purely gratuitous. There are no known facts which prove it. Who has ever found them in the blood of a patient suffering from disease of this character. On the other hand, there is much positive evidence against the probability of such explanation of the causation of intermittents.

Thus fungi flourish everywhere, provided only the conditions of growth are present: if there be a mass of decomposing matter in the city, it will be covered with fungi just as quickly as though it were in the country, showing that the spores are equally present in the air. Again, if the ex-

istence of fungi in the blood were the cause of the paroxysms, how could intermittents be cured save by the long-continued exhibition of some remedy capable of exerting a poisonous influence upon them? Further, there are in certain of the lower animals diseases undoubtedly caused by or at least connected with the presence of fungi in the blood, and the history of these diseases differs *in toto* from that of intermittent. This will be developed more fully in the latter part of the article.

If malaria be not then some organized being, some protophyte or protozoon—what is its nature? Is it some hidden odylie force, or is it an organic product or educt? Are there any facts which throw light upon this problem?

The genetic connection between malaria and the decomposition of vegetable matter is so well established that it is allowable here to take it for granted. If any one has any doubts upon this subject, he is respectfully referred to the article on Malaria in *Aitken's Science and Practice of Medicine*.

There is a disease which, although very different from intermittent fevers, seems to result from a cause in some degree related to or parallel with that of the latter. This is the so-called Hay Fever. In two cases which I have studied, the symptoms come on at about the time malarial fevers are to be expected, are more or less regularly intermittent, the patients having their alternate "well and sick days," and the disease is immediately arrested by frost. In one of these cases for a succession of years the attacks of hay-fever, which was not simply intermittent bronchitis, each year ended in a well-marked intermittent fever, or at least in a febrile attack assuming the ordinary features of a malarial intermittent. Further, the hay-fever poison and malaria are both least active in cities, and are connected with vegetation; they are both most operative in the latter part of summer, and both seem to be influenced by frost. Such are the points of resemblance; they are by no means sufficient to render probable genetic identity, but do seem to point towards similarity of nature of cause. What then is the nature of the hay-fever poison? It appears not to be any one plant or any one tribe of plants which gives origin to it. It cannot always be pollen, for in many cases plants not in flower are as irritating as those in full bloom. Indeed, the proof of its ever being simply pollen seems wanting. When smelling a rose produces it, what proof is there that it is not some emanation from the petals, especially so when we remember the very small amount of pollen produced in any ordinary double rose, in which the stamens have been converted into petals. Proximity to the forest, to the meadow-grass, to the salt marshes, to the garden, appear to be equally unbearable to many sufferers. In one of the cases alluded to, a watermelon brought upon the table would produce such violent symptoms as speedily to drive the patient out of the room.

The theory which ascribes the production of hay-fever to various effluvia, probably organic principles, seems at present the only tenable one. Dif-

ferent persons are probably similarly affected by different effluvia; the one by that given off by the rose; the other by that of ipecacuanha; the third by that from any green thing, and so on; which fact this theory seems well to harmonize with.

It is well-known that in certain persons the mere proximity to the common poison vine (*Rhus toxicodendron*) will produce an erysipelatoid inflammation of the face, hands, etc., without actual contact. This, until recently, was almost as mysterious as the production of intermittents, but now, thanks to Prof. Maisch, the poison is known to be a definite, volatile, organic principle—toxicodendric acid.

Taking into consideration all the facts passed in review, it seems most probable that the poison of malaria is an organic principle, or possibly several principles produced during vegetable decay under certain conditions. The idea that it is an effluvium from various algæ has long been held on the continent of Europe. This is not so absolutely untenable as the theory of Prof. S., and must be carefully distinguished from it. According to the latter the minute unicellular algæ rise into the air, and act, as it were, parasitically upon the blood; according to the former theory the larger fresh-water confervoideæ, and, indeed, plants scarcely to be classed as algæ, the characeæ, exhale a subtile volatile poison, they themselves being much too gross to be carried freely in the air. In a recently published letter Prof. Hannon says:—

“In 1843 I studied at the University of Liege. The windows and mantelpiece of my chamber were encumbered with plates filled with *vaucheria*, *oscillatoria*, and *confervæ*. My preceptor said to me: ‘Take care at the period of their fructification, for the spores of the algæ give intermittent fever; I have had it every time I have studied them too closely.’ As I cultivated my algæ in pure water, and not in the *water of the marsh where I gathered them*, I did not attach any importance to the remark. I suffered for my carelessness a month later, at the period of their fructification. I was taken with shivering; my teeth chattered; I had the fever, which lasted six weeks.”

Such testimony as this would go far to substantiate the connection between the growth of algæ and miasm, were it not evident that Prof. H., spent much time in the marsh alluded to in gathering his plants, and, in so doing, was very much exposed to the malarial poison therein existent in its most concentrated form.

The period of fruiting of the algæ, in this country at least, does not coincide with the prevalence of intermittents. The *vaucheria*, mentioned in the letter, fruit in the early spring and summer, as do most of the *confervæ*, whilst no one has yet seen the fructification of the *oscillatoria*, either in this country or Europe. During the last two years the cultivation and study of the fresh-water algæ has occupied most of my leisure, and my room is often crowded with them, but no intermittent has been produced.

The experience, however, of the British in Wallachia, seems enough to set at rest the whole question of the genetic relation of malaria and algæ. The troops were encamped on a plain, whose surface was composed of

sand, so dry that no vegetation could exist upon it, save some stunted heath plants. Below this surface stratum, however, was a mass of delta-soil, constantly wet and filled with organic matters. It is evident that algæ could not grow in this under soil, their whole natural history forbidding it, but the circumstances were most favourable for vegetable decomposition, and as a consequence the most malignant malarial diseases decimated the troops.

Yellow fever closely resembles, in many respects, some of the more deadly forms of malarial disease, and as a sequence to the labours of Dr. Salisbury come very naturally those of Dr. Schmidt.¹ If one establishes his point, the position of the other is thereby very sensibly strengthened.

The observations of Dr. Schmidt seem to have been made with care, and are interesting. They show, however, nothing more than the wide-spread presence of organic spores during the prevalence of the fever, and great rapidity in their development in the streets. Is not this always the case, in a dirty city, during a hot damp summer? He found monads, vibrios, and protococci present in specimens of black vomit, none of them, however, constantly so. He claims, however, as constantly present, as follows :—

“Independent of these granules, however, there is another kind, which almost always aggregated in masses, are met with throughout the matter. The inexperienced observer might easily take them to be a collection of granules from the epithelium, or for masses of dead monads, but they are neither of these. The granules in question have very dark and thick outlines with a very clear and rather refractive centre, and when collected in large masses assume a greenish tint; not merely are they found aggregated to form free masses floating in the liquid or upon those patches of epithelium, but they are also observed in smaller groups adhering to the individual epithelial cells. When I first noticed these granular masses, I knew not where they came from, for I was certain that they belonged not to the elements I have above referred to; soon, however, I saw others here and there among them of more or less larger diameters; at the same time there were double ones, and also fully-grown spores of fungi. I remained no longer in doubt about the nature of the dark-bordered granules.

“The masses of germs were always present. Sometimes the whole mass consisted already of spores twice the diameter of the granule. The smallest germs have a diameter of about $\frac{1}{25000}$ ths of an inch. They then enlarge to be developed into a mature spore which consists of an oval cell of about $\frac{1}{15000}$ ths of an inch long and $\frac{1}{15000}$ ths of an inch wide. The filamentous tubes developed from the latter vary in thickness, but their mean diameter is about $\frac{1}{5000}$ th of an inch. The sporules originate by free cell formation and within the tubes of the fungus.”

The identity of the dark-bordered granules and the larger fungal spores ought to be fully proven before being accepted, since the usual plan is for such spores to be fully formed before being set free from the parent plant. Moreover, to establish as a fact, their universal presence in black vomit would require the finding of them as constant, by *different* observers, in different places and in various epidemics. Let it be allowed, however, for the sake of the argument, that Dr. Schmidt has shown that they are invariably present in that fatal fluid; even then, he has no more proven them

¹ Researches into the Pathology and Cause of the present Epidemic, ordinarily called Yellow Fever. *Southern Journal of the Medical Sciences*, November, 1867.

to be the *cause* of yellow fever, than did Dr. Thomas Tittlebat substantiate his case, when he asserted maggots to be the ordinary cause of death, because he found them so universal in carcasses.

In a series of papers published in this Journal, Dr. Salisbury claims to have discovered the protophytes which produce measles, rheumatism, and syphilis. If he has done this, the question of the nature of disease-poison may be looked upon as settled, and it is therefore very necessary to carefully examine his statements.

Of all these memoirs, the most plausible are those in which the straw fungus is claimed to be the cause of the measles.

Dr. J. Janvier Woodward, U. S. A., in his work on the Camp Diseases of the late war, renders it very probable that there is some fallacy underlying Prof. Salisbury's observations. He states that though it is true that epidemics of measles have commenced in camps, in which the men were lying upon straw; yet the disease has also broken out in barrack buildings, where the men laid on the floor on their blankets without straw, and also in camps where no straw was furnished to the men, who slept upon cedar twigs or India-rubber blankets. Dr. Woodward further says:—

"Camp measles has prevailed almost exclusively in the regiments raised in the rural districts, while those from cities and towns have been more or less completely exempt. In the same manner regiments composed of foreigners have been almost totally exempt. The explanation of these facts is simple. The exempt were those who had had the disease prior to their entry into the service. Those who had hitherto escaped were the sufferers. The inference is inevitable that recruits from the country have generally escaped the disease before their enlistment, while those from towns have usually suffered from it at some previous period. Personal inquiry in regiments, where measles is prevailing speedily shows this inference to be correct. . . . If, now, Dr. Salisbury's theory is correct, if the straw fungus is the veritable cause of measles, how does it happen that this disease is more common in the towns than in the country? How does it happen that so many thousands of recruits from the remote rural districts have escaped the disorder through youth and adolescence?"

The straw fungus is to be found in all places where there is straw: the stack, stable, barn, and threshing-floors should, therefore, be foci of disease. How then, if Dr. Salisbury's theory be correct, do farmers' children so generally escape the disease? Dr. Woodward also tried inoculating himself and others with the fungus, without, however, producing any effect, except sometimes the formation of a little ulcer at the point of inoculation.

Dr. Wm. Pepper, physician to the Philadelphia Hospital, has instituted a number of experiments with the straw fungus, so elaborate and made under such peculiarly favourable circumstances, that they seem to definitely prove that inoculation with the straw fungus will neither produce measles nor protect the system against the disease. As these experiments have never been published, they are inserted here in full. I also extract from an unpublished inaugural thesis of Dr. Charles E. Smith, of St. Paul, Minnesota, an account of some researches made by him in Camp Cadwalader, near this city.

"At the military camp—Camp Cadwalader, near this city—measles appeared on March 11th, 1864. The weather before and during the whole month was cold and damp, with a great deal of snow and rain. The number of men in camp varied, some arriving, others going 'to the front;' the aggregate, however, was two thousand. The men slept in tents on loose straw. There had been no case of measles in the camp since January 1st, at which time Dr. Michler took charge; I know not whether any occurred prior to that period.

"The men came from different parts of the city and country, and not one of them at the time they were attacked remembered to have been exposed to the disease. On the afternoon of the eleventh one man reported sick with this disease, the rash just making its appearance; the next morning five others were admitted to hospital in the same condition.

"Between this time and April 1st there were twenty cases more. In but one case did the eruption appear before they had slept on straw. The duration of the initiatory symptoms, so far as I could ascertain from their history, varied from two to fourteen days; the rash appearing in some cases the next day after sleeping on straw, in others not until after several days. Two of the patients were old soldiers, and had been exposed to the cause, if it originates in straw, many times without its having affected them, and at the time of their attack were in floored tents with bunks, and no straw whatever. Subsequent inquiries made of these men elicited nothing to account for the appearance of this disorder, except in one case:—

"Edwin Pursur, aged twenty-one, said that while he was in the barracks in the city, before being sent to camp, he had slept next a man 'who was somewhat sick and had a red breaking out over his face and neck.'

"This was the case in which the eruption appeared on the eleventh, before he had slept on straw at all, for in the barracks they sleep on their blankets on the bare boards.

"Some straw was taken from the tents of those attacked with measles, and at the time examined with a pocket lens for fungi, subsequently by the microscope, without finding them either time.

"From this it will appear that the occurrence of measles at Camp Cadwalader, which at first would seem to have been due to fungi from straw, was, in all probability, caused by contagion.

"Now, as all the recruits who were sent to this camp were first received in barracks, and detained there until enough had arrived to form a squad of sufficient size to send out, this one man having been exposed to the disease there, as his statement shows, is it not reasonable to suppose that the other five men in whom the rash appeared the next day after their arrival in camp, having come from the same county in the same squad, sent to the same barracks, and thence to camp together, with the man before mentioned, that they also were exposed to the same cause in the barracks and thus acquired the disease? Surely measles would not be developed even to the appearance of the eruption by sleeping one night on straw.

"The other cases which occurred subsequently, I have no doubt, were the direct results of contagion from the first six.

"Is it not just as probable, that the epidemic of measles which appeared at Camp Sherman (see Dr. Salisbury's paper) was caused in the same way, and the cause had escaped detection?"

Dr. William Pepper's experiments were as follows:—

"The subjects were children in the Blockley Almshouse, where a malignant epidemic of measles was raging at the time.

"Seven were inoculated; in one the initiatory symptoms had developed themselves at the time the operation was performed, which was done in the hope that it might modify the disease. This child subsequently died, the scar on the arm having healed as a simple abrasion would. This one and five others were under three years of age, and in none of the five had any symptoms whatever been developed. The seventh, aged ten, had some irritation around the point of inoculation, followed in a day or two by symptoms of a common cold in the head, which soon passed off. He had not been exposed to any contagion either previously or subsequently.

"Eleven cases were inoculated, in the same institution, on November 24th.

"Five were between the ages of eighteen and twenty-three; six were children between the ages of three and eight months. The points of inoculation in all presented no traces of inflammation, no itching, and the slight abrasion made by the point of the lancet soon disappeared.

"Up to December 14th no trace of anything abnormal was seen.

"The grown persons stated that they never had had measles, so far as they knew. The children never had; they were born in the house, and never had been vaccinated even.

"The points of inoculation were examined with a pocket lens for the radiating red lines described by Dr. S., but without success.

"I made four other experiments also, on the persons of young men from the country, two aged seventeen, the other two eighteen.

"I inoculated them November 20th, and had them to sleep on loose straw. Up to January 10th no sign of anything abnormal was seen. These, also, never had had the disease. All these experiments were performed carefully, and the subjects were examined twice a day up to the times mentioned.

"The fungi were examined under the microscope before any of the operations were performed and found to correspond to the drawings of them given by Dr. S.

"Thus, out of the twenty-two subjects experimented upon, one only had any symptom developed; this was a slight cold in the head; but this might have been an accidental circumstance and not at all owing to the inoculation, as it did not appear in any of the twenty-one other cases.

"It seems that if the fungi have any power in causing this disease, it would have shown itself in those children under one year of age."

In the October number of this Journal, for 1867, appeared Dr. Salisbury's paper on rheumatism; a paper which, if confirmed, must revolutionize our present pathology, and render famous its author. If my memory is not at fault, Prof. Beale somewhere remarks that it is much easier to detect unreliable microscopic work in plates than in text. A careful study of the illustrations of the paper alluded to is then worth the trouble. *Ex uno disce omnes.*

A glance at Figures 1, 2, 3 (p. 376, *Am. Journ. Med. Sc.*, 1867) will show that for the most part they are absolutely identical; Figs. 2 and 3 have each a few crystalloid granules or crystals scattered through the mass, otherwise all three figures offer no differences. Yet Fig. 1 is a "plug of algaloid spore (*zymotosis translucens*);" Fig. 2, "granules of cystine;" Fig. 3, "mass of oxalate of lime." Many of the little masses given under Fig. 4 have all the indefinite but at the same time somewhat characteristic appearances of the inorganic particles always present on dirty slides. Most of the figures of fig. 8 would pass in a class room for rude drawings of maize starch grains, which certainly possess the peculiar diagnostic character of stelline, as given by Dr. S., namely, a crack, or peculiar stellate fracture in or near the centre. Further, many of the crystals of Figure 4 are undistinguishable from those given under Figure 8, yet the former are "crystals of cystine," the latter "crystals of stelline."

Such is the *prima facie* evidence derivable from the plate. What are the results obtainable by following the investigations of Prof. S.? Do they coincide with his?

Shortly after my attention was directed to this subject, a highly intel-

ligent medical gentleman, an occasional contributor to this Journal, paid a visit to this city. He had spent some time with the Professor, and been not only greatly impressed by the importance of his discoveries, but also thoroughly initiated into them as well as into his method of working. Acknowledgments are due to him for pointing out in several instances stelline, cystine, and algoid spore masses, at least such he affirmed certain bodies to be, and they all agreed well in appearance with the figures of the various substances as given in the paper of Dr. S. In my mind the conviction fastened itself that they were almost all extraneous matters. It is well to state that the doctor met at various times during his visit most of the best medical microscopists in the city, and, so far as known, did not fail to convince any one, that the stelline and cystine of Dr. Salisbury were extraneous matters.

Having been initiated into Prof. Salisbury's method of procedure, I have examined the blood of a number of persons, both male and female, suffering from rheumatic disorder. All the ordinary types of the disease have been included in these examinations, inflammatory rheumatism, the sub-acute, muscular variety, and the chronic form, with various intermediate cases, and in all these, without a single exception, the results have been purely negative. In most instances these explorations were made in company with other microscopists, who also failed to find any abnormalities. In each case several slides of blood have been most laboriously and thoroughly explored, and in one instance of very marked inflammatory rheumatism, several ounces of blood were drawn from the arm and almost a whole afternoon given to its study. My thanks are due to Dr. Herbert Norris, of the Pennsylvania Hospital, for facilities afforded and assistance in this work. I have also received directly from Prof. Salisbury, through the mail, several mounted slides with blood containing, according to him, stelline, stellurine, &c. &c. Owing to the very defective mounting of most of them the blood was so dried as to render impossible a satisfactory examination. One slide, however, arrived in good condition, and the most careful study of it with as high powers as the very thick glass cover would allow, revealed nothing more than may be seen in any carelessly mounted blood. There was an abundance of foreign matter, such as woollen fibre, particles of dust, &c., but nothing cryptogamic or crystalline. The study of this slide was participated in both by Drs. J. G. Hunt and Wm. Pepper, of this city, two of our best microscopists, the one especially in a botanical, the other in a pathological direction, and they fully agree in the above statement. An examination of the other slides produced the same negative results, except that in one labelled as taken from a man suffering from *amyloid degeneration of the heart!* the whole mass was found to have been changed into magnificent and most distinctive blood crystals. Are some of Prof. S.'s pathological products of this nature? They certainly seem to be formed *outside* of rather than within the body, if it be allowable to judge from

a letter received from him. It is no breach of propriety, I trust, to extract the following passage, as the same idea has been expressed by the Professor in his recent paper in the *N. York Medical Journal*, although not so briefly and positively, and therefore not so suitably for quotation. He says:—

“Many times I explore a single drop of blood for hours before discovering pathological products. When a drop is first placed between the slides the blood-disks frequently so cover up the abnormal bodies that they are not for some little time discoverable.”

With this light it is very conceivable at least how an honest observer might think he saw plugs of spores existing in rheumatic blood. If rouleaux of very adhesive corpuscles be watched whilst drying, they will be seen to undergo the following changes: First, the well-known crenations appear, then by and by the individual corpuscles lose their outlines, becoming as it were fused together into one. In this way elongated masses are formed, and the crenations still persisting, under an inferior objective, or under a good objective not carefully adjusted or of too low power, these masses appear granular, each granule being in fact the point of a crenation.

One of the most recent announcements of Dr. Salisbury is that of the discovery of the plants which produce syphilis and gonorrhœa. Of all known diseases, the one, the natural history of which is most irreconcilable with the idea of a fungus as the cause, is syphilis. Why is contact necessary for its passage from one individual to the other if spores or fungi be the cause? Why do not the latter follow the course of all known fungi, and be wafted through the air?

But, suppose Prof. S. to be correct; a man then has connection with a woman infected with the *crypta syphilitica*, and, as a consequence, has a few days following a peculiar ulcer, caused by the plant, which ulcer becomes a new centre of growth for the cryptogam, whence the spores travel to infect the system. Under appropriate treatment the symptoms disappear, and perhaps for years the health seems re-established. But no, the *crypta syphilitica* is lurking somewhere in the blood, the bones, the muscles, or viscera, and favouring circumstances may call it into active, growing life, when all the ravages which have made secondary syphilis a byword of terror and caution are but its footprints. If apparently dormant, still it may be forming its spores, and every spermatozoon which is formed in the man is freighted with its fatal load, to germinate, multiply, and to blast the new life, to which the sperm gives origin. If in round numbers the greatest transverse diameter of a human spermatozoon be $\frac{1}{50000}$ of an inch, what must be the size of the spores of *crypta syphilitica* to be contained in it? Prof. S. apparently figures them as objects of comparatively large size, but does not give definite information on this point. All of our ordinary fungi perish themselves in the act of producing spores. Not so with this plant, mayhap; for forty years it lives in the testicle, giving off

a constant stream of its spores, living all the time, too, without injuring the tissue in which it is, without interfering with the function of the gland in which it has taken up its abode! The whole asserted life-history of the *Crypta syphilitica* is so at variance with that of other fungi, as to cast a shadow of doubt upon the observations, even if they had been made in the most skilful manner and by the most experienced observer. In reality, however, the whole memoir bears the impress of a want of care, if not of skill and knowledge.

It is hardly conceivable that any one, with even a very superficial knowledge of the natural history of the protophytes, and of the generic or specific values of characters possessed by them, would give such a generic description as is given of the genus *crypta*. Not only does it not afford a single family, generic, or specific character, but it is shown to be incorrect by the context itself. For if such a plant does exist, it is a fungus, not "algoid," as the description has it.

Putting all this to one side as not actually disproving Prof. S.'s positive assertions, that the syphilitic poison is a vegetable growth, Dr. William Pepper (Lecturer on Pathology in the University of Pennsylvania) and myself carefully studied a number of chancres at the Philadelphia Hospital, to which he is attending physician. We failed to find any cryptogams therein, but did find various shreds of coagulated mucus and fibrous tissue, as well as granular matters within and without cells, all of which resembled the drawings of the filaments and spores as given by Dr. Salisbury. Since this, Dr. Willard, Resident Physician at the above hospital, has sent me from time to time sloughs obtained by the action of caustics on fresh chancres. These I have very carefully examined with powers ranging from 400 to 800 diameters, and affirm most positively that there were no cryptogams whatever in them, but that they consisted simply of the usual tissue debris.

The experiences of Dr. S. Weir Mitchell, in repeating Prof. S.'s experiments, on rattlesnake venom; of Prof. Leidy, in regard to the spleen; of Drs. Woodward, Pepper, and Smith, in relation to the straw fungus; of various observers, in regard to the cryptogamic origin of syphilis and rheumatism, all so completely coincide as to justify our doubting the correctness of Dr. S.'s observations, until they shall be confirmed by other observers, or demonstrated before some medical society.

It is now almost a generation since the late Prof. Mitchell exhausted speculation in relation to the fungoid origin of general diseases. Before that, and still perhaps more actively since, numerous observers have been searching eagerly, mostly with negative results; but occasionally the discovery has been apparently made. Always, however, the prize has escaped their grasp—further observation has overthrown their conclusions, the *ignis fatuus* of their hopes has vanished in the moment of their seizing it. Some of the most prominent names of botanical and medical science have

been engaged in this pursuit. A notable instance of this is Prof. Langenbeck, who found in the morbid secretion of a glandered horse what he believed to be a peculiar fungus, the cause of the disease. Virchow, however, showed that it was a puccinia, frequently existent in normal human secretions, and by no means always present in cases of glanders. The recent investigations of Prof. Hallier upon the origin of cholera are no exception to the assertion made above. It seems at present very doubtful whether these will be confirmed, and, if they are, they show the Asiatic plague to be a *local*, not a general affection.

That certain vegetable organisms, vibrios and their allies, are found in the blood in some cases of disease, seems, however, to be well established, but that they are present as a consequence, not as a cause of the morbid processes, seems equally certain. The whole natural history of these curious bodies is still involved in doubt. Some of the best recent authorities class them with the algæ, where they evidently do not belong, as they do not possess chlorophyl, and feed solely on organic matter.

Again, Pineau, and more recently Clark, assert that they have seen vibrios being jerked off decaying muscular fibre, which was being directly transformed into them. Accept this, and they must be regarded merely as forms of dead matter, or refuge be taken in the doctrine of spontaneous generation. The view of Frau Lüders, of Kiel, is, however, the most recent, and probably the true one. She states as the results of her observation and experiments, that they are stages of various fungi. It is most probable that the various fermentations are caused by the growth of fungi in the fluid, and that putrefaction is of such nature. Prof. Wyman, of Cambridge, Mass., is very positive as to the agency of these vibrios and their allies in the production of the latter process. In a letter received from him he says:—

“Although my experiments were not made with reference to the subject of putrefaction, yet during the progress of them certain facts were noticed which have a bearing upon your question. The conclusion which is forced upon my mind by them is that organic matter is a *stable* compound, in itself undergoing no change, but only in the presence of some outside force. In sealed flasks its stability is maintained in the presence both of air and water. I have preserved organic solutions in this way for two years, and they would no doubt have been kept indefinitely.

“If, in addition to air and water, living infusoria are present, they change at once and are in part converted into living organisms, and are partly decomposed. So it seems to me that we must give up the old dogma, that the ‘vital forces’ hold things together, and that they go to pieces as soon as these forces are withdrawn, because the atoms can then satisfy their ordinary affinities. The real source of their destruction is to be found in the reaction of surrounding organisms, and not from that of internal forces.

“In view of all the facts, I see nothing on which putrefaction hinges but the infusoria. It is quite clear that the solutions boiled for several hours are not thereby disqualified from putrefying, for you have only to open the flasks and the process will begin at once.”

On the other hand, Donné, as quoted by Bennett, states that “hens’ eggs become putrid without the formation of vibrios and other infusoria,” and

Prof. Leidy has stated, in conversation, that in his experiments the liquids contained in certain flasks, which were protected from the access of spores, underwent very decided change without the development of living forms.

Whether the views of Prof. Wyman be correct or not, it is certain that under ordinary circumstances vibrios, &c., are always the accompaniments of putrefaction, and may frequently be found in a fluid, before it has undergone more manifest changes. In the *miltbrand* of domestic animals, and its probable derivative in man, malignant pustule, these bodies have frequently been found in the blood, but are said not to be present in all cases, and when present, to be of fatal significance. *A priori* reasoning suggests that their spores are of very necessity at all times present in the blood, and the experiments of Frau Lüders seem to establish this. That lady took a small glass tube with the ends hermetically closed, which had been exposed for half an hour to a temperature of 290° C., and thrust it into the heart of a recently killed guinea-pig, and then broke off the ends. After the blood had been sucked into the tube from the other end, which was melted off, to remove any fluid that might adhere from the lips, the ends of the tube were sealed, and it was kept at the temperature of from 13° to 15° C. After two days fungous granules, chains, and rods were abundant. If then the spores of vibrionidæ be always present in the blood, they must of very necessity develop themselves, whenever that fluid is strongly predisposed to putrefactive changes, as it is in malignant pustule. Their development is a consequence, not a cause of the disease; for if a cause, they would be present in all the cases. So far, then, from these observations lending support to the cryptogamic theory of disease, do they not give great significance to the negative arguments against it? There is no difficulty in finding the fungi in putrefying liquids in or out of the body; why, then, if they be present in the blood of exanthematous patients, can they not be demonstrated? In the vaccine scab there is an exanthematous poison in its most concentrated form. If such poison be fungoid, this virus can certainly be little else than a mass of spores. The scab, however, has been most carefully studied by some of the best microscopists that have ever lived, with powers sufficient to demonstrate the structure of a spore the twenty thousandth of an inch in diameter, without finding any such body. The only possible way of explaining this, and maintaining the integrity of the cryptogamic theory is by *supposing* the existence in the virus of infinitely minute spores, which is making a *supposition* to establish a *supposition*, a fair example of the whole tissue of argument on which the theory rests.

It is proverbially difficult to establish a negation. Still, there may be such an accumulation of negative evidence, as to create a probability so strong as to be worthy to be received as a demonstrated fact, just as circumstantial evidence will frequently convict the criminal. Probabilities thus founded become almost certainties when strongly corroborated by

positive facts. Such facts seem to exist in this case. It is apparently impossible that any of the algæ can cause a general disease from reasons heretofore adduced. Our present knowledge of the natural history of the fungi, especially of their known relations to disease, tends very strongly in the same direction.

It is very certain that numerous *local* affections are produced by the growth of fungi in tissues. These plants are in some cases so placed that they could readily enter the blood and produce systemic diseases if such were their habit. Thus the fungoid growth *Aspergillus pulmonum hominis* has been found by Drs. Von Dusch and Pagen Stecker (*Archiv. Générale de Méd.*, 5e sér. tome xl. p. 738) in the tissue of tubercular lungs, and even in some of the pulmonic capillaries. As another example may be mentioned the curious foot disease of India, in which a mucedinous fungus (*Chionyphe carteri*) eats its way into the tarsal and metatarsal bones, and even, in time, into the lower ends of the tibia and tarsus. This fungus frequently kills its victim, never, however, by producing a general systemic disorder. The affection preserves throughout its strictly local character, the patient dying eventually of the exhaustion induced by it. If in fungi is to be found the origin of blood diseases, surely in both of these cases everything is most favourable for the production of the symptoms known as those of blood poisoning, and yet in neither are such symptoms manifested.

In what manner do fungi act in producing the various local diseases to which they give rise?

They seem to exert an influence not merely as irritants or passive foreign matters, but by inducing chemical changes mostly in tissues already weakened by disease, changes which are somewhat similar to those of putrefaction and are the result of the life force of the plant seizing on certain elements or compounds for its nutriment. In other words, the fungus feeds on the tissue, and *continues* to grow and feed so long as material is afforded it, unless destroyed by some outside influence, or unless, indeed, the vital powers of the part are so strengthened as to be enabled successfully to resist its encroachments.

The exanthemata are self-limited diseases, *i. e.*, affections which have a fixed, definite course, and which terminate spontaneously if the patient live long enough. The fungal diseases march steadily onwards, have no fixed course, are in no sense self-limited. As proof and example of this take the Indian foot disease already alluded to.

The nearest known approach to the production of systemic disease by fungi is seen in the affections of certain of the lower animals. Their spores have been found in the blood in some of these cases. Do they act in such instances as poisons, producing limited diseases, as typhus, small-pox, etc.? No. On the contrary, they appear to act on the blood as they do upon other tissues, producing a local disease of it, so to speak, giving

origin to a steadily progressive train of symptoms. They feed upon the nutritive fluid, form filaments in it which pierce the walls of the vessels, and ramify through all the tissues.

The most carefully studied of these affections is that which attacks the ordinary house-fly. The first appearance of this disease is the presence of very minute oval cells in the circulating fluid, which cells increase in number, enlarge, grow into filaments, pierce the bloodvessels, and ramify through all the tissues, gradually destroying them. Whilst this is going on, the fly evidently becomes weaker and weaker; by and by the hind legs swell up, stiffen, and all power over them is lost. Then the other limbs undergo similar changes, and finally the little invalid breathes its life out. In eight or ten hours after death, the filaments continuing to grow, pierce through the surface of the body, especially between the wings, and interlace over it to form a whitish winding sheet. By the latter and by their stiffened, projecting legs, flies, dead from this affection, may be readily recognized. Does this course correspond with that of our systemic affections? No! It seems somewhat doubtful, even in these cases, whether the fungus is the original cause of the disease, for, thus far, all attempts at inoculating healthy flies have failed. Fungi are the scavengers of the vegetable world; and it is very possible that the plant merely preys upon an already mortally stricken fly, just as the hyena will feed upon living animals if they are sufficiently prostrated by disease.

The asserted power of the sulphites in arresting zymotic and malarial diseases is relied on by some as affording a substantial argument in favour of the cryptogamic theory. The answer to such reflex arguments is very simple. In the first place, it is by no means proven that the sulphites have the despotic power over these diseases which is claimed for them. Allowing, however, all their most ardent friends claim, there is no proof whatever that their remedial properties are dependent on their poisonous influence upon protophytes or protozoa. The whole set of deductions are purely suppositions and in a circle. Substances possessing such wonderful power over the germinal, living matter of all the lower plants and animals, are to be expected to exert a more or less powerful influence upon the living germinal matter of the higher animals, and at present there is nothing known which disproves the theory that these sulphites act remedially simply by modifying the life actions in some unknown way, or, in other words, by altering nutrition; indeed there is at present no proof of the truth of almost any theory. So far, from our present knowledge of the therapeutics of the sulphites lending aid and comfort to the cryptogamists, it seems to me to afford very conclusive proof that the truth is not with those gentlemen. If a fungus causes a zymosis and the sulphite kills the fungus, the disease must be arrested. The case should invariably follow immediately upon the exhibition of the remedy. The medicine is a specific removing the cause, and, if given sufficiently early, should never fail.

It is, however, notorious that it does often fail; hence the very fair inference that the cause is not removed by it, is not either a protophyte or a protozoon. A sulphite never fails to arrest fermentation outside of the body—why should it fail inside?

Even Prof. Polli himself has abandoned the idea, if he ever really believed it, of the sulphites acting upon the blood as they do upon yeast, purifying it by killing the cryptogams in it.

In conclusion, perhaps it is allowable to state that some two or three years since the writer of this paper was very strongly inclined to believe in the doctrine of animate contagion, having imbibed it during his student life, and that this essay has not been the result solely of studies especially undertaken for the purpose; but that during the prosecution of other microscopic investigations, the evidence so gathered itself in his mind as to lead him into this by-path, and to leave with him no doubt that general diseases are not caused by organic entities. There is a vast accumulation of negative evidence which repudiates the doctrine of animate contagion, either as taught by Linnæus or by more recent authorities. There are no known facts establishing the doctrine; there are many such which strongly support the negative proposition.

JULY 1, 1868.

ART. III.—*Relation of Cancer and Tubercle.* By E. HOLDEN, M. D.,
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N. J.

It is, perhaps, not surprising that a belief should exist in the minds of many professional men, that these two diseases are in some way akin; that, in fact, the one may be but the modification of the other; and that, *cæteris paribus*, the victim of cancer might have been the prey to consumption.

The subject has been recently (as no doubt often before) presented in a plausible manner before the London Medical Society by Weeden Cooke, F. R. C. S., and the alliance and probable identity of the two diseases strongly urged.

Having at hand material never before made available in this country for throwing light on so interesting a subject, in the experience of one of our largest life insurance companies during a period of twenty-three years, I present the following reasons for dissenting from any ideas of identity or similarity between the two affections. It is, indeed, in the matter of life insurance that the question of relationship assumes its chief interest. Cases of cancer and consumption are so frequently found side by side in a family history, that it is a point of no small importance whether they are

or are not to be regarded as evidences of an identical diathesis. Before presenting the facts, however, above alluded to, a few remarks regarding the abstract question of relationship may not be uninteresting, and a plain viewing of the matter from different standpoints assist in arriving at a correct conclusion.

1. Is there anything in the elementary structure of tubercle that shows affiliation with cancer?

2. Is there any similarity in their manner of development? and,

3. Is there any evidence that the tubercular taint can produce cancer, or *vice versâ*?

But for the latter method of putting the question the two former might have been considered answered by the microscope before the valuable investigations of Lebert, or the more recent studies of Beale; yet they are still pertinent, and the microscope fails, alone, to furnish an answer that may be relied upon as final. Yet, what has it shown? In both instances are seen what appear to be cells, both containing nuclei, and what were once believed to be nucleoli; yet here the resemblance ceases, and the microscope of the present day shows these nuclei to be in the one case granules simply. Lebert, in his work on Pathological Physiology, maintained this view, and has been supported by the researches of Virchow. The most complete evidence, however, of the actual difference between them is found in their size; even the nuclei of cancer-globules are much larger than the entire tubercle-globule. (The globule of scirrhus has a diameter of .0175 of a millimetre, their nuclei about .0125, and the whole tubercle globule about .0075, according to the measurements of Lebert.)

Taking the view of other writers, that the tubercle-corpusele is not a cell, but an exudation, having little tendency to the cell form, the original molecular matter melting into mere nuclei, which are developed no farther (Bennett), and the difference is still more marked.

It would, however, be superfluous to dilate upon microscopical characteristics which are probably familiar; as far, however, as the powers of the present microscope have permitted us to judge, we may infer entire dissimilarity, yet it is impossible to deny that, under some circumstances, appearances may favour a directly opposite conclusion. For example, in cancerous tumours are not unfrequently found globules not to be distinguished, save by the most expert, from tubercle; the advocates of identity in the two diseases maintaining, from this circumstance, a probable origin from the same blastema. When we reflect, however, upon the possible resemblance of the tubercle globule to that of pus also, and that eminent pathologists have even asserted tuberculization to be but a modification of suppuration, we may accept the more readily the statement of Lebert, that these are but cancer-globules, altered by the deposit of granules of fat in their interior, or at any rate admit that they are not tubercle-globules,

simply because they resemble them. Chemically, the difference is one becoming marked only in the process of growth; recent tubercle varying but little from other albuminous compounds.

The discussion of elementary resemblance has, however, with some pathologists, appeared to turn upon the question of inherent vitality or power of growth; and this leads to the second proposition, viz: whether there is any similitude in the manner of development? By this is meant, not simply the growth, maturity, and decay of the individual cell or corpuscle, but the development into the characteristic disease.

In both there is shrinking, alteration of shape, and disintegration into granules, but in "tubercle no tendency has ever been shown by the microscope to organization." In spite of the assertion that vascularity has been detected in it, it possesses no fibrous stroma, as is the case with cancer. Tubercle, moreover, spreads by contiguous deposits; cancer, by inherent power of growth. In the one case we have an unorganized body, a foreign substance; in the other, a vitalized product, with its wonderful multiplication of cells undergoing a rapid transmutation from birth to decay. But, to be more specific, it would be proper to consider the manner of development in a tissue like the lung, not so much in regard to individual and diagnostic signs—which amount to hardly more than difference in appearance of sputa, a greater duration of solidification prior to softening, and the persistence and character of the pain—as in the fact that, as stated by Flint, in cancerous infiltration of one lung, the signs of solidification are confined exclusively to one side, the other affording no evidence of disease. With a similar amount of tubercle in one lung, more or less of the evidence of tubercular deposit in the other would be expected.

In regard to the third proposition, whether any evidence exists that the tubercular taint has ever produced cancer, and *vice versa*, it is worthy of remark that, as shown by Walshe (*Cyclop. Surg.*, vol. i. p. 623), cancer and tubercle rarely coexist, though they are not antagonistic. We know, moreover, that when cancer has been removed, and subsequent disease attacks the lungs, the disease is rarely tubercle, but cancer. It is, indeed, undisputed that the two are rarely found combined, and isolated cases of such combination can have no more significance than the far more frequent association of certain syphilitic developments with either of them, and perhaps, were it not for the peculiarities attending the origin of the latter disease, a much clearer resemblance in development could be traced between it and cancer than has ever been accomplished between the diseases we are considering.

There is, however, another and most important relation of this question in reference to interchangeable or modifying essential qualities, and that is, its hereditary relation. If it can be shown that the offspring of tuberculous parentage is peculiarly liable to cancer, as we know it is to tubercle, all our microscopical and clinical observation amounts to nothing; the fact of identity of essence becomes established, whatever may be the modification

of such essence undergone in process of transmission. I say peculiarly liable, for even if it were a fact—which it is not, as will be presently shown—that the offspring of tuberculous parentage is *somewhat* more liable to cancer than that of uncontaminated blood, it could prove nothing, for, in accordance with a natural law, an impure fountain cannot give forth pure waters.

In the essay of Mr. W. Cooke, before referred to, this subject of hereditary influence is made the chief basis of the author's argument. He states that of *seventy-nine* cases of scirrhus breast, *thirty-one* could trace a positive hereditary tendency to phthisis. We may well inquire, What is here meant by an hereditary tendency? Is it one, two, or three cases, and are these to be in one's immediate family, or within the circle of near relatives? Is it to be among brothers and sisters, or among parents only? The term is a loose one upon which to base a conclusion, and I am convinced, from extensive investigation into this very subject, that of any *seventy-nine* well persons, taken indiscriminately, this same and even a larger number could be found in whose circle of near relatives one, two, or three cases of consumption had occurred.

The following facts may be found, collectively, to have great weight in assisting to a just conclusion. Certainly, if they show anything, they show most decidedly that cancer and tubercle are in no manner akin, much less identical.

Of *seven thousand and thirty* persons over *forty years of age*, *one thousand and thirty-two* had consumption in their own immediate families—parents, brothers, or sisters—and *two hundred and forty-seven* of these in two or more members; yet in these one thousand and thirty-two families only *eleven cases* of cancer had ever occurred, while of the whole number (7030) there had been *ninety-nine* cases of cancer in all. Eleven of them, therefore, only were in consumptive families, eighty-eight per cent. arising in families free from tubercular taint.

Persons over forty years of age have been thus taken, since the families of such may be presumed to have had time enough to develop any cancerous taint. In fact, it may be well enough to state that more than one-half of these persons were over *forty-five* years of age.

It will be observed that there is no evading the evident conclusion thus presented, and the only plausible objection to considering it final and overwhelming is one purely hypothetical, and that is, that the transmission of cancer is most frequently other than immediate, making atavism, in truth, a rule rather than, as with tubercle, the exception.

But further, of 55 deaths occurring in 821 families tainted with consumption, but *one* was occasioned by cancer, 33 by consumption. Still further, of one thousand deaths from diseases of the bowels and appendages, there were thirteen from cancer, and in but one of the families of these had consumption occurred, save one having both cancer and consumption.

Further comment would appear to be superfluous.

ART. IV.—*Excessive Hemorrhage following an Incised Wound of the Eyeball.* By W. P. MOON, M.D., Philadelphia, Pa.

THE following case is presented from the very unusual circumstance of a slight wound of the eyeball, giving rise to almost fatal hemorrhage. Having examined a large number of authorities, I have not been able to find a case in which hemorrhage resulted from a similar wound, although, in other respects, the injury is a most common one. The treatment was conducted simply upon general principles. To me the case has been one of considerable interest in all its bearings; and since others, with more experience in the injuries of the eye, regard the case as unusual, I have been led to record its history.

James L., aged 18, while holding a cold chisel of large size, Feb. 1, 1868, at I. P. Morris & Co.'s Foundry, for a fellow-workman who was cutting rivets from a steam-boiler, a "flake" of steel from the head of the chisel, or a "chip" from the rivet, three-quarters of an inch long, half an inch wide at one end, and one-eighth of an inch at the other, sharp on one edge, penetrated the lower lid of the right eye, five-eighths of an inch from the inner canthus, making a clean incision through the tarsal border half an inch long; passing through the sclerotic and cornea, it lodged in the upper part of the cornea. The wound was slightly oblique from within outwards, and about three-quarters of an inch in length in the sclerotic and cornea. There was only a trifling amount of bleeding at this time, which ceased entirely when the piece of steel was extracted, which was done by a physician in the neighbourhood. As the eye was not examined very closely, I could not learn whether any vitreous humour had escaped at the time or not. The patient was then sent to Wills Hospital, and on the way hemorrhage suddenly supervened; and he becoming weakened by the loss of blood, was taken to a drug store, and I was called to visit him. During the interval cold applications had been used without any good effect; the blood issuing from between the lids in a stream, coursed down the face. On opening the lids, a clean cut was observed, with a slight hernia of the iris, from the central portion of which the blood flowed in a steady, pulsating stream. The young man was evidently much depressed, the wound having bled upwards of an hour; and it seemed to me to be more immediately necessary to check the hemorrhage rather than to think about the safety of the eye. A solution of the persulphate of iron was applied directly to the wound; the lids closed; a compress of lint, saturated with the iron, applied with gentle pressure. The bleeding still continuing, a larger saturated compress was placed on the lid, and the solution poured upon the blood as it flowed from under the compress. As it ceased issuing at one point, it oozed out at others; and this continued so long that extirpation of the eyeball, or ligation of the carotid, in order to stop the flow, was necessarily thought of. After persevering with the styptic for three-quarters of an hour, I had the satisfaction of seeing the stream measurably diminished, and it ceased altogether after a bandage was applied tolerably tight, the slight dropping being controlled by stuffing cotton and the persulphate of iron under the edges of the bandage. The patient was conveyed home in an ambulance. There was very little bleeding on the

way, and scarcely any after he arrived. Warm bricks were ordered, as he was very much chilled, and half a grain of morphia given; a quarter of a grain more to be given in two hours, if he did not rest well by that time; and absolute quiet was strictly enjoined. The morning following he was comfortable, without pain, very weak, and with a small, quick, irritable pulse. Ordered pil. opii gr. ij, which was to be repeated at night, and a diet of broth or gruel.

Thirty-six hours after the receipt of the injury the patient's general condition was more favourable. When the dressings were removed, the corneal and sclerotic wounds *appeared* to be nearly closed, the former being clear, and without protrusion of the iris; conjunctiva considerably congested; the iris moderately dilated, and apparently *in situ*, with evident inflammatory action settling in. A small quantity of blood was observed in the anterior chamber. On opening the lid the patient said, "I can see"—demonstrating that there was no great accumulation of blood, probably, in the posterior part of the globe. The wound in the tarsal border, which was gaping, was closed with a single suture, atropia applied to the eye, and a compress, moistened with cold water, adjusted; and the opium continued.

As the interest in this case lies entirely in the seriousness and arrest of the hemorrhage, it is not necessary to continue its history and progress. There was considerable inflammation of the sclerotic and conjunctiva, which gradually subsided. Like most similar injuries, traumatic cataract has resulted. There is attachment of the iris to the lens, and to the corneal portion of the wound. A slight choroid protrusion occurred at one time, which has receded, and the wound is entirely healed. The cornea is natural, with some little vision.

Dr. Morton, Surgeon to the Wills Hospital, has reported to me several cases which bear upon the subject of serious hemorrhage from the eye, or following the ordinary operations in ophthalmic surgery; in two instances after the introduction of styles, and once after excision of an eyeball, very alarming hemorrhage followed. In one case severe and continued hemorrhage followed the extirpation of a glaucomatous eyeball, in an elderly lady, which resisted all the usual topical remedies—such as ice, cold cloths, simple astringents, and pressure—and, after continuing for several hours, was only arrested by clearing out the clots, and filling the cavity with powdered Monsel's salt, and superadding a compress. Slight cerebral disturbance followed, but quickly passed away.

In regard to the arrest of hemorrhage from the globe, after wounds, Dr. Morton has suggested the introduction of one or more sutures in the sclerotic, thus effectually occluding the lacerated bleeding vessels. This plan was once adopted by him in a gaping, lacerated wound of the sclerotic, with intra-ocular hemorrhage, the wound uniting by first intention, the suture not giving the least trouble. No great amount of hemorrhage could follow after this simple procedure, for the suture can be drawn quite firmly, without any risk, provided the needle is passed simply through the sclerotic coat.

Lawson mentions two instances in which Mr. Bowman used sutures in

the sclerotic where union was delayed. This I feared would have to be done in my case at one time; but the wound readily healed without it. In the first patient there was a wound in the sclerotic, which had remained patulous for three days; and, in the second, no attempt at union had taken place one week after the accident; yet, in each case, immediate union followed after the edges of the wound had been brought into accurate apposition by a single fine thread suture. In the first case there was oozing of the vitreous, but no hemorrhage in either. Cooper gives one case in which there was serious hemorrhage after excision of the eyeball, and that was in a gentleman of gouty tendency. In another, he speaks of having tied a branch of the ophthalmic artery after excision of the globe. In cases of intra-ocular hemorrhage, he thinks there are two courses open to us—"to extirpate the ball, or adopt palliative measures;" and cites a case related by St. John Edwards, in which a blow upon the eye gave rise to intra-arachnoid hemorrhage which proved fatal. From five to six ounces of blood were found in the left arachnoid cavity, extending downwards to the base of the brain. The smaller wing of the sphenoid bone was found disarticulated and displaced backwards and upwards, exactly in a position to have wounded the middle cerebral artery in the fissure of Sylvius.

Baron Larrey alludes to the striking of bullets upon the margin of the orbit as a cause of intra-ocular hemorrhage and effusion of blood into the chambers of the eye as being common, but only dangerous in respect to the organ itself.

In my own case I am at a loss to account for so serious and continuous hemorrhage. It has been asked, "How much blood was lost?" That, of course, I cannot pretend to tell; but there was an amount sufficient to so reduce a strong, hearty, full-blooded man, that he had to be carried home to his bed, from which he was unable to rise for ten days. The hemorrhage may have come from the anterior ciliary, or a branch of the long ciliary, or from both, as they may have both been divided, I think, from the character and course of the incision.

I found, while attending him, that he was of hemorrhagic tendency; for if a pimple was rubbed, or the skin broken, considerable bleeding followed, and on two occasions he had free hemorrhage from the nose.

As soon as I had examined the eye, and saw the state of the case, the question arose—If I can check the hemorrhage by means of persulphate of iron, will this preparation injure the organ itself? My impression was that it would do harm to the corneal structure, and, if inserted into the globe, must lead to its destruction, so far as vision was concerned. But the preservation of the man's life seemed of far more importance than the loss of the eye. Had not the persulphate of iron arrested the hemorrhage, it was my intention to extirpate the globe. Contrary to my expectations, the iron did not injure the cornea. How much it may be responsible for

subsequent changes in the internal structures of the eye, I am unable to say—but I think there has been no undue inflammatory action; and this, with Dr. Morton's case, in which he used Monsel's salt for hemorrhage after extirpation of the eyeball, go to show, in some measure, that the objection raised by Stellwag is unfounded. In speaking of hemorrhage after excision of the globe, and the use of the tampon as a means of arresting it, he says: "The use of the hot iron as a hemostatic, is, from the proximity of the brain, dangerous—and, moreover, not trustworthy. For the same reason, sesquichloride of iron should not be used, as it chemically changes the blood in the vessels to a great distance, and occasions the formation of plugs, which might readily prove injurious when in the vessels at the base of the brain."

Suppose the tampon will not stop the hemorrhage—for plugging was ineffectual in Dr. Morton's case—we are of necessity driven to try some other means, and I do not know of any more effectual than the persulphate of iron, nor more likely to prove harmless.

March 6. After weeks of suffering, the inflammatory action progressing steadily, but being confined entirely to the structures of the eye, suppuration of the crystalline lens and vitreous humour followed, accompanied with inflammation of the external coats. The left eye beginning to sympathize, I decided to extirpate the injured eye. The patient rapidly recovered, with no untoward symptom.

ART. V.—*Case of Excision of the Entire Scapula, to which is added a History of the Operations involving the Removal of all, or a considerable part of this Bone; with the view of establishing the Surgical Character and Prognosis of this Class of Operations.* By STEPHEN ROGERS, M. D., of New York. (With five wood-cuts.)

CASE.—A girl six years of age, perfectly healthy parents, came under my observation, during the early part of 1867, for an injury of slight character to the elbow of the left side. Before she had recovered the perfect use of the elbow-joint, my attention was called by the mother to a small and almost painless tumour located in the infra-spinous fossa of the left scapula. It was of an oval form, its long diameter corresponding to that of the fossa, was smooth and firm, though somewhat elastic, and the skin overlying it was not in the least discolored, and it appeared to be movable upon the subjacent scapula. It was at that time about the size of a large hen's egg, and had not given any discomfort, the attention of the child having been called to it but a very short time before, by the slightest feeling of uneasiness at the point. As the child's general health was excellent, the history of its ancestry without an exception or even a suspicion, the tumour was at first regarded by me as a deep abscess resulting from some injury, of which there was an imperfect history. After

watching it for a few weeks, I ascertained that it was slowly increasing, that the skin over it was a little reddened, and its temperature increased. Misled by the apparent fluctuation, I at length determined to introduce a very small bistoury to the bone with the hope of liberating any pus that might there be confined. None, however, was found; the puncture contracted a little, but did not close; but, on the contrary, became a fistulous track for the escape of sero-purulent fluid. After this discharge had been thoroughly established, it was on one occasion hastily examined by the microscope, and found to contain many granular nucleolar bodies, which I was disposed to regard—erroneously, as was afterwards shown—as free nuclei of disintegrated cartilage cells. The tumour continued to grow slowly till, at about four months after its discovery, it filled the greater part of the infra-spinous fossa. It had now become a source of much discomfort to the patient, disabling the arm very materially. Upon the supposition that it was an enchondroma, its removal was advised, consented to, and undertaken. The operation revealed the fact that it was a growth from the surface of the scapula, that the infra-spinatus muscle was stretched out over the surface of the tumour, and that when the tumour was removed the bone was considerably roughened and softened at the point of its attachment. All this softened portion having been gonged and scraped away, the wound was closed with but a single ligature—which had been employed to secure the infra-spinous branch of the supra-scapular artery. The tumour was very firm, slightly elastic, and of a milky whiteness, cutting more like cartilage than anything else. The microscope, however, showed no elements of cartilage in its structure. It was composed almost altogether of aggregated free cancer nuclei, held together by a very small amount of stroma. It was now manifest that the nucleolar structure, formerly seen in the discharges from the puncture, was simply some of these free cancer nuclei of which the mass was made up. Some of these had nucleoli, others none. It was, in short, an osteo-cancer of the nucleolar variety, and would be very liable to return in the medullary form. The wound, however, healed promptly, and the patient was discharged, but with the almost certainty that the disease would soon return. After the wound had been cicatrized about two months, a small nodule made its appearance on the surface of the scapula a little above the point of attachment of the first tumour, and grew rather slowly for some two or three months. The character of the disease being now thoroughly understood, the parents were advised to have the entire bone removed as the only means of affording any chance of saving the life of the child for any protracted period. This advice was, however, not followed, but on the contrary, irritating applications were made to it by so-called cancer doctors, which stimulated it into frightful activity, so that from a tumour of the size of a hen's egg, it grew in about two months to the size of half of the child's head, with many points of superficial ulceration. The applications were now discontinued, and the ulcers healed. A temporary arrest of the progress of the growth also marked the suspension of the use of the ointment. After a few weeks, however, it was again seen to be increasing, the general health now began to fail, the tumour was now painful, it had involved the entire scapula, was encroaching upon the humerus and clavicle, and presented a lobulated form with numerous large veins coursing over it, and a very considerable portion of the integument covering it was livid and adherent to the diseased tissues beneath. The tumour extended from well inward near the base of the neck, outwards and downwards to the axilla, and measured over its surface in that direction about ten inches. It extended from well over the head of the humerus in

front, to beyond the posterior border of the scapula, and measured over its surface in this direction about ten inches. There was a small axillary tumour, and a similar glandular enlargement a little beyond the edge of the tumour on the side of the neck.

The parents, frightened at the failing health of the child and her manifest early destruction by the disease, resolved to have an effort made to save her, and again brought her to me. Though an extremely unpromising case as to any permanently good result from the removal of the diseased bone, the sufferings of the little patient, and her rapidly failing health, seemed to call for the operation as a palliative, if no more could be hoped. I did not share the fears expressed by some of the surgeons at the consultation, that the patient would die of shock at, or soon after the operation.

The removal of the diseased bone and other diseased structure was decided upon, and the operation was performed on the 12th of December, 1867, when the patient was seven years and nearly five months old. The plan of the operation was to include all of the diseased integument upon the surface of the tumour within the ellipse formed by an anterior and a posterior curved incision extending from the cervical base of the tumour, downward to the axilla. The integument was then to be reflected from the whole posterior portion of the tumour, and its attachments to the trunk divided, so as to raise it from the walls of the chest and tip it forward, thus exposing the scapulo-humeral articulation posteriorly; loss of blood meanwhile was to be carefully prevented by tying all bleeding vessels at once, whether arteries or veins. No bone was to be touched except that found diseased. In accordance with this plan, the posterior incision was first made, and the integument reflected, and then in their order were next divided the trapezius, rhomboidei and the levator anguli scapulae muscles. This freed the tumour and diseased scapula from the chest, so that it could be lifted up from the ribs and tilted outward and forward, permitting an inspection of the subscapular portion. In order to fully accomplish this, however, it became necessary to cut away a small portion of the latissimus dorsi, which had become firmly adherent to the tumour at the point this muscle plays over the scapula, also to divide the serratus magnus. This examination showed that the subscapularis muscle was too much involved in the disease to encourage any attempt to save it, so its tendon was divided near the joint, and it was taken with the scapula. As the mass was tipped forward, the coracoid process was seen to be nearly torn away from the body of the bone; an accident resulting from the extreme disease and disintegration of the bone. The division at this stage of the operation, of the coraco-clavicular ligaments, the tendons of the pectoralis minor, of the biceps and of the coraco-brachialis saved this process, and it was removed with the mass. The acromion process, however, was left behind and subsequently dissected away from its attachments to the clavicle. The division of the tendon of the subscapularis having exposed the joint capsule, this was now opened about half way around, fully exposing the joint, and finishing the dissection posteriorly. The mass was now returned to its natural position, and the dissection from in front commenced by an incision in accordance with the plan of the operation above described. In order to avoid all suspected integument, this incision had to be carried in its central portion so far forward as to reach the perpendicular line of the joint, and was an unfavourable circumstance, as will presently be seen. The deep dissection from this anterior incision consisted in, first, the division of the entire scapular portion of the deltoid; second, in the completion of the division of the capsule including the coraco-humeral ligament, the

tendons of the supra- and infra-spinatus and the teres minor muscles; and, third, in the division of the long head of the biceps. The mass now fell away from the body still attached only by the teres major and the long head of the triceps, which were lastly divided. The operation was concluded by the removal of an enlarged axillary gland, and another one of less size from the cervical region. The amount of hemorrhage was unexpectedly small; the subscapular artery, being the principal one requiring ligature, was tied a short distance from its origin. But three or four ligatures were used. This vast opening exposing the ribs, readily closed up, and the line of the united edges of the wound fell about an inch and a quarter posterior to the head of the humerus, which was fixed by appropriate bandaging directly beneath the acromial end of the clavicle. Reaction was completely established in three hours, a remarkably slight consecutive fever followed, a considerable portion of the extensive wound united by adhesion, the ligatures came away in the usual time, leaving the remainder of the wound to heal by granulation, which it did completely in about forty days. The adhesive process which united the integument to the wound effected a separation of the edges of the flaps at their central portions, leaving a gape at the widest point of about half an inch, through which the posterior portion of the head of the humerus could be seen, and the progress of formation of new attachments and surroundings could be daily observed. The usual process of roughening and ulceration of its synovial and cartilaginous surface could be seen, and the final appearance of red granulations over the whole ulcerated surface, which formed a part of the granular bed of the closing cicatrix. Owing to the accidental displacement of a broad bandage which had been passed down over the clavicle and under the elbow, for the purpose of maintaining the head of the humerus in close proximity to the outer end of the clavicle, undue pressure had been made upon the skin covering the extremity of that bone,

Fig. 1.

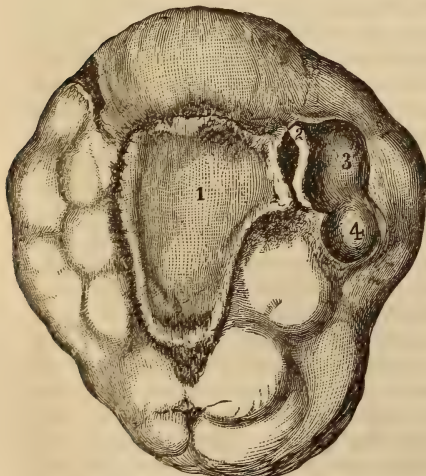


Fig. 2.



FIG. 1.—1. The body of the scapula. 2. The articular cartilage separated from the bone by disease. 3 and 4. Facets upon the surface of the tumour, made by the head and neck of the humerus.

during the first twenty-four hours after the operation, causing it to slough. Nothing serious resulted from it, however, and it cicatrized before the

principal wound. The disease was osteo-cancer of the medullary variety, involving the entire scapula, even the processes, and the tumour, six hours after its removal, weighed a little more than three pounds, the weight of the entire body of the child at the time of the operation being thirty-six pounds. After freezing the tumour, it was divided by the saw through the perpendicular plane of the inclosed scapula, and that section exhibits the relations of the bone to the tumour, as well as their relative sizes, perfectly, and it is very well represented by Fig. 1, which is one-fourth the size of the tumour. The wound had completely cicatrized by about the fortieth day, the health of the patient was excellent to all appearances, she had become fat and had grown in stature; and at forty-five days after the operation, the general and local appearances were as the accompanying plates represent: Figs. 2, 3, 4, 5. Any written description of her condition as

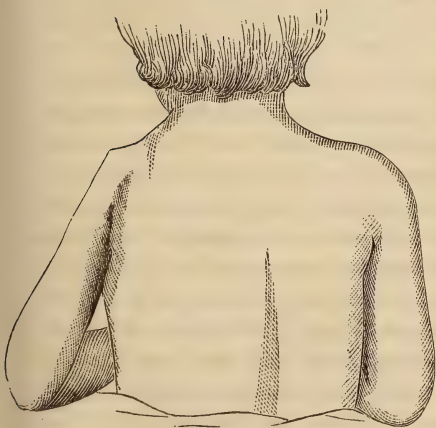
Fig. 3.



Fig. 4.



Fig. 5.



respects utility of the preserved arm seems to me superfluous, with these figures, taken from photographs, before us. They exhibit various extremes

of voluntary movement of the arm possessed by this patient at about forty-five days after the removal of the scapula. She could, besides these movements, elevate the arm from the side, between twenty and thirty degrees. Subsequently, all the voluntary movements acquired still greater range. So useful had the extremity become at about the fortieth day, that had it been the right side, it would hardly have been impaired for writing or easy sewing. When dressed, the resulting deformity was scarcely noticeable. In respect to the utility of the extremity, and the deformity, this case has resulted as successfully as there was any anatomical possibility of its doing, and more so than there was much reason to expect it would.

The patient died, however, six months after the operation, of a return of the disease, which took place in the following order: *a.* Enlargement of the cervical glands near the upper point of the cicatrix. *b.* Cancerous disease of the bones of the spine at and about the lowest point of origin of the trapezius muscle, viz., the lower dorsal and upper lumbar vertebræ, which produced paralysis of the lower extremity. *c.* Development of intrathoracic cancer, of which she finally died. *d.* Cancerous growths of considerable size in the tissues surrounding the seat of the excised tumour.

The removal of the entire scapula with the attempt to retain the upper extremity is, so far as I can obtain information upon the subject, a modern advance in surgery. The earliest published proposition to adopt this operative expedient for the retention of the extremity without the scapula, which I have met with, is that of Liston, in 1819. Mr. Fergusson, in his *Lectures on the Progress of Surgery*, speaks of this proposition of Liston in the following language:—

“In a month, the patient, from whom Mr. Liston removed about three-fourths of the scapula, went home with the wound nearly healed. A few weeks afterwards it assumed an unhealthy aspect, and gradually a dark purple excrescence grew from it, accompanied by occasional alarming hemorrhage. Liston proposed to remove the *remaining* portion of the *scapula* and half of the clavicle. He represented the ease with which the subclavian could be tied by turning forward the scapula from the ribs. He could get no one, however, to second his opinion, and he was very unwillingly obliged to give up all thoughts of operating.”

The next nearest approach to this idea I find in a memoir of Petrequin, of Lyons, who, in reporting a case in which he removed all of the scapula except the glenoid cavity and the processes, remarked that “the removal of the scapula *at the neck* is not only admissible, but an indicated operation, the object being the preservation of the symmetry of the shoulder as well as the use of the arm.” His total silence as to the removal of the entire bone, with the same objects, indicates, as it appears to me, that this author did not recognize it as a justifiable operation, or that he knew nothing about it. As Petrequin was well acquainted with the literature of French surgery, he may fairly be taken to represent it at that time, upon the subject of removal of the scapula, and, therefore, that the operation under discussion was unknown among French surgeons at that date (1859), or at least unrecognized.

Among the Germans, however, we find Reid, of Jena, urging the prac-

ticability and propriety of the operation of removing the entire scapula, with the preservation of the arm, in certain cases, as early as 1847, though no case presented itself to him on which he could demonstrate his doctrines. Fergusson awards the credit of first practising the operation to Syme, of Edinburgh. (*Lectures on the Progress of Surgery*.) "Removal of the scapula, with at the same time preservation of the arm," he remarks, "is entirely a modern achievement in surgery, and for which we are indebted to Syme, of Edinburgh." This statement is manifestly erroneous, for there can be no question that Langenbeck, of Berlin, removed the entire scapula, preserving the arm, in 1855. The question of priority, therefore, is settled in favour of the latter. The history of the operation, from its first performance by this surgeon down to the present date, is quickly told. We are, apparently, safe in regarding it, as Mr. Fergusson does, a modern operation.

Our standard works on surgery are very meagre of information upon the subject; some of them, indeed, being entirely silent. As to the French writers, Petrequin remarks upon the almost total neglect of the whole subject by them, and enumerates some of the most voluminous of their works as utterly silent upon the operation under discussion. Among the writers in our own language, of whom we might expect an extended account, may be mentioned Mr. Holmes, who has devoted but a short paragraph to the subject of removal of the scapula, in his article on excisions. Prof. Gross has given the subject more attention, and has enriched it with a case of his own. It is remarkable that Liston, after his experience with disease of the scapula, should have omitted to even mention the subject in his *Surgery*; and still more remarkable that, during the course of his lectures, in after life, upon the diseases of the bones, he should have said, "Little need be said about the scapula, as it is seldom diseased." He does not even allude to his own case of malignant disease of this bone, which has been so generally quoted by later writers. Mr. South, in his edition of Chelius, has done the subject very fair justice up to the date of his publication. It was, however, reserved for the energetic Syme to really contribute to the subject in a durable form. The late edition of his surgical work contains the clear record of his three cases. Should Sir William Fergusson prepare a new edition of his *Surgery*, his recent experience would no doubt enable him to add very much to the section upon the scapula. If we may judge from his language, he may be regarded as almost enthusiastic in support of the operations which, while they remove the scapula, preserve the arm. In the course of his lectures already quoted he took occasion to say:—

"Six years have now elapsed since Mr. Jones, of Jersey, removed the whole of the scapula, preserving the limb, and the patient lives in excellent health, with a useful arm, and I here present a photograph recently taken, showing her figure." (For figure, see *Lancet*, June 18, 1864, Fig. 10. Also the recent volume of *Lectures on the Progress of Surgery*, London, 1867.)

On the same occasion, after relating the early history of Syme's second case, he went on to remark that—

"In November, 1862, the scapula, with a portion of the clavicle, was removed by that enterprising surgeon; and in January, 1864, Mr. Syme reported that this patient remains in perfect health, with a wonderfully useful arm. Here is his figure [see *Lancet*, June 18, 1864, Fig. 11, and the vol. already referred to], in which he is represented in the act of holding up a heavy chair with the preserved limb, to show the vigour still retained. Looking to the fact that this man had already lost the head of the humerus, the case seems to me the *ne plus ultra* of conservative surgery."

"Contrast these cases," exclaims Mr. Fergusson, "with a sketch of my own case [see vol. already referred to] of removal of the scapula after the arm had been amputated at the shoulder-joint by some rash hand before. The loss of the arm seems deplorable, and, looking at it as having occurred some fifteen years prior to the operations of Syme and Jones, the contrast speaks volumes in favour of that progress for which I now plead, and I know of no bolder conservative feats in surgery than those of the two gentlemen just mentioned."

Such are the sentiments of Mr. Fergusson upon the subject of removing the scapula and saving the arm, and certainly no surgeon has had better opportunities for maturing his judgment. I will therefore repeat my belief that, should he publish a new edition of his *Surgery*, he will systematize his knowledge and experience into an ample chapter upon exsections of the scapula. The literature upon the subject at the present time is disseminated over a vast field of periodical publications, and but two attempts have been made to gather it up into a form to make it useful for the guidance of the surgeon, so far as I have been able to ascertain. One of these was made by Petrequin in 1859, in his paper before alluded to, and the other by Günther, in his surgical summary in 1860. Of the former paper I can only say that it is a most imperfect and superficial production, adding no material information to the subject, and entirely omitting much that is valuable. Günther's article, however, is much more complete, omitting, indeed, very little material which existed at the date of its publication. These two papers, one in French and the other in German, comprise all that I have been able to find upon the subject of operations upon the scapula, apart from the isolated reports of individual cases. But since these reports, a very considerable amount of material has been added to the subject, by published and unpublished experience of surgeons in various parts of the world; and to add this in a concise form to that which had been published, as well as supply omissions of former publications and arrange the mass of material so as to be available for scientific reference for readers of the English language, I have prepared the following tabular statement. It embodies the history of operations involving the loss of more or less of the scapula in their chronological order, and is as nearly complete as my time and that of several of my professional friends would enable us to make it.

Tabular Statement of the Operations involving the Removal of all or the greater part of the Scapula.

No.	Operator.	Date.	Operation.	Disease.	Result.	Remarks.
1	Mr. Cummings	1808	Amputation of arm including the scapula	Gunshot comminution of these bones	Recovery	This accident occurred to an adult male.
2	Van Walther	1811	Attempt to remove the greater part of the scapula	"Spongy swelling upon the bone"	Died fourteen days after the operation of suppuration and exhaustion	This patient was a man 30 years of age. The operation was abandoned at an advanced stage, on account of the patient's having fainted, and it was regarded as too formidable to again undertake.
3	Mr. Liston	1819	Removal of about three-quarters of the scapula, measuring from behind forwards. The patient was a boy of 16 years.	Osteo-cancer of a remarkably vascular form	Died soon after of a return of the disease	The hemorrhage during this operation is described as having been frightful, it chiefly taking place at the time the body of the scapula was divided to separate the diseased from the sound bone.
4	Heymann, of Coblenz	1823	Removal of all the bone, except the neck, supra-spinous fossa, and the acromion process.	Osteo-cancer in a young man of 22 years	Recovery with good use of the arm, but he died a year after the operation of return of the disease	
5	Janson, of Lyons	1824	Removal of all the bone, except its processes and the neck and glenoid cavity.	Osteo-cancer of the bone in a female of 45 years	She was discharged two months after the operation with a useful arm on this same side	This growth is said to have been from the infra-spinous fossa, and to have projected forwards into the axilla so much as to prevent the arm from falling nearer to the side than 45°.
6	Wutzer, of Münster	1825	Removal of all of the bone except its processes and glenoid cavity. Patient a man of 44 years.	Osteo-cancer of the medullary variety	Recovery with good use of the arm, but the disease returned at length, and the patient died of it four years after the operation	
7	Castara, of Lunéville, France	1826	Attempted removal of the greater part of the bone.	"Tumour of the scapula"	Patient died of air in the veins during the operation	This accident is reported to have occurred during the division of the bone between the sound and diseased tissue.
8	Mr. Luke	1828	Removal of three-quarters of the bone measuring from behind forwards	"Supposed malignant disease of the bone," the patient being a girl of 14 years	Recovered with a most useful arm	This operation is described as having been a very bloody one, and that more than twenty arteries were tied during it.
9	Mr. Skey	1830	Removed all of the bone except the glenoid cavity	"Fibrous tumour," of large size, patient being a man of 40 years	Recovery with a useful arm	
10	Götani Bey	1830	Removed the scapula and upper extremity	Gunshot wound comminuting these bones	Recovery though the patient was a boy of only 14 years	
11	Jäger	1833	Removed the entire bone except the glenoid cavity and acromion	Caries; the patient being a female of only 8 years	Caries extended to the neighbouring bones, and the patient died 9 months after the operation	This case is reported to have been complicated with tuberculosis, and was probably a tubercular disease of the bones. So far as the arm was concerned, this case was successful, a very useful arm being preserved.
12	Dr. Crosby, of Hanover, U. S.	1835	Removal of the scapula secondary to amputation of the arm	Malignant disease in an adult	Recovery, but died a few months later of a return of the disease	As this case was never reported in the journals, I am indebted to the present Dr. Crosby, of Hanover, for the imperfect account I give of this case.

Tabular Statement of the Operations involving the Removal of all or the greater part of the Scapula—continued.

No.	Operator.	Date.	Operation	Disease.	Result.	Remarks.
13	Syme, of Edinburgh	1836	Removed the neck and glenoid cavity and processes and the head of the humerus	Enchondroma in an adult male	No subsequent history	
14	Mussey	1837	Removed the scapula and clavicle six years after amputation at the shoulder, and 19 years after amputation at the metacarpus.	Osteo-sarcoma, the patient being, at the date of the last operation, 40 years old	Recovery, and at last accounts, 30 years after the last operation, the patient was healthy and active	The malignant character of this disease is sufficiently demonstrated by the fact that it returned twice after operations for its removal. It is therefore a case well calculated to encourage the surgeon to operate for the removal of cancerous bones.
15	Larrey	1838	Removed the scapula and arm.	Gunshot comminution of these bones in a boy of 14 years.	Recovery	It is reported also that this subject received so severe an injury of the scrotum at the same time that castration was necessary, and was performed at the same time.
16	McClellan, of Philadelphia	1838	Removed the scapula, arm, and most of the clavicle at one operation.	Encephaloma in a boy of 17 years	Recovered from the operation and did well for a time, but finally died of return of the disease six months after the operation	McClellan claimed that so far as he knew this was the first case in which the arm, scapula, and clavicle had been removed by the surgeon for disease at a single operation. I think he was correct. Gactani Bey's and Larrey's cases were nearest like it.
17	Mr. Travers	1838	Removed all the scapula below the spine	"Medullary sarcoma;" the patient was an adult male	The patient died one year after the operation of a return of the disease	There is no record pertaining to the state of the arm after the operation in this case. The hemorrhage attending the operation is recorded as very severe.
18	Rigaud, of Strasbourg	1842	Removed the scapula and outer end of clavicle 8 months after amputation at the shoulder	Osteo-sarcoma; patient was a man 51 years old	Recovered, and was enjoying good health three years after the last operation	This case affords as much encouragement to the surgeon as Mussey's case.
19	Dr. Cooper, of British Guiana	1842	Removed one-third of the scapula and outer third of the clavicle.	Machine injury	Recovered	This case is reported more in detail among the cases of tearing away from the body, of the arm and scapula.
20	Petrequin, of Lyons	1844	Removed all the scapula except the glenoid cavity and processes	Osteo-sarcoma; the patient being a boy of 20	Died twenty-five days after the operation	It will be remarked that this operation was almost exactly similar to McClellan's, though its results were vastly better.
21	Mussey	1845	Removed the scapula, arm, and outer half of clavicle at one operation	Osteo-cancer; age of patient not given	Recovered and was in good health nine years after the operation	This patient is reported as having died in consequence more of other severe injuries than those involving the arm and scapula.
22	Dr. Lewis, of Boston	1845	Removal of the scapula and clavicle and a fragment of the arm	Machine injury comminuting these bones	Died soon after the operation	It is reported that at a later period this surgeon performed a second exactly similar operation, but I have failed to find any record of it.
23	Dr. Gilbert, of Philadelphia	1846	Removal of neck and glenoid cavity and processes and arm at one operation	Osteo-cancer; the patient was a medical man	Died five months after the operation of return of the disease	

No	Operator.	Date.	Operation.	Disease.	Result.	Remarks.
24	Textor, Jr.	1846	Removed all of the infra-spinous fossa except a narrow border on its posterior edge	Enchondroma; the patient was a child of two years and two months old	Was discharged well in forty days with good use of the arm	This is the youngest subject on whom this operation is recorded to have been performed.
25	Mr. Ferguson	1847	Removed the scapula and outer end of the clavicle three years after amputation at the shoulder-joint	Caries; the patient was an adult male	Recovery perfect and permanent	
26	Langenbeck	1848	Removed all the scapula except the glenoid cavity and coracoid process	Fracture comminuted of the bone; patient was an adult male	Died of pyæmia on the twenty-first day after the operation	
27	Textor, Jr., of Heidelberg	1849	Removed the greater part of the infra-spinous fossa of the scapula	Osteo-cancer of large size; the patient was a man of 56 years	Recovered with good use of the arm, but the disease returned and destroyed the patient	It is reported that seven distinct operations were performed at various intervals upon this patient for the removal of re-appearing cancerous growths.
28	Langenbeck	1850	Removed the scapula except the coracoid process	Enchondroma softened; the patient was a man of 30 yrs	Died seventeen hours after the operation.	It stands recorded that, in the opinion of the medical men present at this operation, the chloroform had the greater part in the production of the fatal results.
29	Dr. S. D. Gross	1850	Removed all of the scapula except the head and acromion process	Osteo-cancer; the patient was an adult male	Recovered. No record of the condition of the arm	Dr. Gross reports that this patient died of pleuro-pneumonia three months after the operation, and does not think that the fatal disease had any connection with the former disease of the scapula.
30	Hertz, of Erlangen	1852	Removed all the bone except the glenoid cavity and coracoid process	Medullary cancer; the patient was a female of 20 years	Died of loss of blood an hour after the operation	
31	Barriér, of Lyons	1853	Removed the infra-spinous portion of the scapula	Enchondroma of large size; patient an adult	Died within 24 hours after the operation	
32	Engelhardt, of Riga	1853	Removed all the scapula except the glenoid cavity and processes	Necrosis; the patient was a man of 27 years	Recovered, and at four and a half months after was healthy	
33	Langenbeck	1853	Removed the entire scapula and three inches of the clavicle	Osteo-cancer of the encephaloid variety; patient a boy of 12 years	Died of a return of the disease ten months after operation	At the operation 2½ inches of the clavicle were removed, but on account of necrosis at the point of division, half an inch more was subsequently removed. No account is given of the degree of usefulness of the arm after the operation.
34	Syme	1856	Removed the entire scapula	"Sanguineous cyst of the bone," by others regarded as a vascular encephaloma; patient a female of 70 years	Wound healed promptly, and the patient had the best prospects of retaining a useful arm, when she died of old age about two months after the operation	During the progress of the cicatrization the head of the humerus was exposed for some time. This is the first recorded case of removal of the entire scapula in Great Britain.
35	Heyfelder	1857	Removed the scapula and head of the humerus	Caries in an adult	Died on the eighth day after the operation of pyæmia	

Tabular Statement of the Operations involving the Removal of all or the greater part of the Scapula—continued.

No.	Operator.	Date.	Operation.	Disease.	Result.	Remarks.
36	Dr. Carnochan, of New York	1857	Removed nearly three-quarters of the scapula, the division being in an oblique direction from below upwards across the spine	Caries; the patient was an adult male	Recovery with good use of the arm	
37	Mr. Jones, of Jersey	1853	Removed the entire scapula, and about an inch of the outer extremity of the clavicle	Caries; the patient was a girl of 15 years	Recovered promptly and permanently. Six years after the operation was in good health, with a most useful arm	This was the first, and, so far as I know, the last case of removal of the entire scapula for caries, preserving the arm, that has been performed in Great Britain.
38	Niepie	1860	Removed the arm, scapula, and clavicle	Machineline injury	Recovery	
39	Dr. Hammer, of St. Louis	1860	Removed all of the scapula and three-fourths of an inch of the outer end of the clavicle	Osteo-cancer; the patient was a girl of 18 years	Recovered with a useful arm, but finally died of return of the disease ten months after the operation	Dr. Hammer performed a preliminary operation several days before this operation, at which he discovered that the tumour upon the scapula was an outgrowth from the bone. A piece of the mass was removed for microscopic examination, and having been found cancerous, the whole bone was removed a few days after.
40	Mr. Syme	1860	Removed the entire scapula and outer end of clavicle about two inches, the head of the humerus having been removed some time before	Osteo-cancer; the patient was a man of 43 years	Recovered, and had a useful arm, and was enjoying good health some years after the operation	This is the case alluded to by Mr. Ferguson as the <i>ne plus ultra</i> of conservative surgery.
41	Schuh, of Vienna	1860	Removed the entire scapula from a child of eight years	Osteo-cancer	Recovered from the operation, but there is no subsequent history	
42	Dr. Walter, of Pittsburg, Pa.	1860	Removed by eudection all of the scapula except the neck, glenoid cavity, and acromion	Necrosis; the patient was a boy of 17 years at the time of the operation	Recovered, and six months after the operation had a perfect use of the arm, and the bone was nearly perfectly reproduced	Velpeau alludes to a case recorded by Risland and another by Chopart, in both of which a reproduction of bone took place after a resection in the scapula had been removed. Dr. Walter states that his patient had a nearly perfect scapula reproduced by the periosteum left behind.
43	Neudörfer	1862	Removed the greater part of the scapula	Necrosis, following a gunshot comminution of the bone in an adult	Recovered with a useful arm	
44	Mr. Paget	1862	Removed all the infra-scapular portion of the bone except the inferior angle, and also part of the spine	Osteo-cancer in a boy whose age is not given	No subsequent history of the case is found recorded	
45	Weinker, of Glesseu	1863	Removed all of the scapula except the glenoid cavity and acromion	Encephaloma; the patient was a young man of 17½ years	Died of exhaustion within twenty-four hours after the operation	This case was the theme of an inaugural dissertation at Felsing in 1863.
46	Mr. Syme	1863	Removed the scapula and outer half of the clavicle with the arm	Osteo-cancer; the patient was a man of 40 years	Recovered, and was in good health some years after the operation	

No.	Operator.	Date.	Operation.	Disease.	Result.	Remarks.
47	Michaux, of France	1864	Removed the entire scapula and no more	Encephaloma	Recovered with a useful arm, but the disease returned, and the patient died ten months after the operation	This patient had previously lost the arm by amputation for the same disease, and in respect to the number of operations for diseased growth it resembled case No. 27 of this table.
48	Back, of New York	1864	Removed the scapula and part of the clavicle	Osteo-cancer; the patient was an adult male	Recovered, but a few months after died of a return of the disease	Fergusson claimed this to have been the third case of removal of the entire scapula in Great Britain and London. He opened the joint first in front. This experience led him to say that, were he to perform the operation again, he would isolate the posterior portion of the scapula first, opening the joint from behind first, leaving the anterior portion of the incision and disarticulation to the last. He also advocated the leaving of the acromion when it is not diseased as tending to reduce the deformity. This patient finally became the subject of the operation described as the 52d one of this table.
49	Fergusson	1865	Removed all of the scapula except the acromion process	Encephaloma; the patient was a man of 25 years	Recovered from the operation, and at the end of the first month had considerable antero-posterior movement of the arm. There is no record of the case after that date	
50	Fergusson	1865	Removed all of the scapula below the spine	Fibro-recurrent tumour involving all of the infra-spinous fossa; the patient was a girl of 19 years	Recovered from the operation promptly with good use of the arm	
51	Mr. Pollock	1865	Removed the entire scapula except the acromion	Osteo-cancer of large size; the patient was a girl of 16 years	Recovered from the operation, and had a useful arm eleven weeks after the operation, date of last report of her	This was precisely the operation of Fergusson, with his suggestion of isolating the tumour from behind first carried into practice by Mr. Pollock.
52	Fergusson	1866	Removed all the scapula left by the operation No. 50, the clavicle and the arm	Fibro-recurrent tumour; the patient was 20 years of age at the time of this operation	Recovered from the operation, but there is no subsequent history	
53	Fergusson	1867	Removed the scapula, part of the clavicle, and the arm at one operation	Osteo-cancer; this patient was a man of 40 years	Died of shock three days after the operation	This operation was like McClellan's, as to extent, but its unfortunate termination was probably induced by the condition of low vitality of the patient indicated by the fatty degeneration of the heart, kidneys, & liver.
54	Busch	No date	Removed scapula and part of clavicle after amputation of the arm	Osteo-cancer; patient a female, but the age not given	Recovered from the operation, and two years after she earned her living by work in a factory	
55	Busch	No date	Removed the entire scapula except the glenoid cavity	Cause not stated	Died of exhausting suppuration	
56	Stephen Rogers, of New York	1867	Removed the entire scapula and no more	Osteo-cancer of the encephaloid variety in a girl of 7 years	Recovered from the operation, but died of return of the disease six months after the operation	This patient had good use of the arm till its movements were impeded by new cancerous growths about the shoulder. Patient died of apnea from the pressure of mediastinal cancer.

This statement affords all the evidence necessary, it appears to me, to convince the most sceptical surgeon that no part of the scapula is absolutely necessary to the possession of a very useful arm. Of the fifty-six cases given in this table, in twenty-five, or nearly fifty per cent., at least three-fourths of the scapula was removed. Of these twenty-five, sixteen are reported as having been followed by a good use of the corresponding arm, about sixty-five per cent. The fact, in truth, being that all the patients who survived the operations, and did not suffer an early return of the disease, retained a good use of the arm. We do not learn from the exhibit of this table that the removal of the entire scapula is a more serious operation than the removal of the greater part of it, for it appears that of the forty-five cases in which more or less of the scapula was removed, ten died of causes more or less directly connected with the operation. One, for example, died of loss of blood; one of air in the veins during the operation; four of exhausting suppuration; three from the shock of the operation and exhaustion; and one from pyæmia. This makes a total of one in four and a half. Now, if we look at the cases in which the entire scapula was removed, preserving the arm, and in a few of them the clavicle was involved also, we see that death as a result, even remotely, of the operation did not occur in any of them. This result is very markedly in support of Mr. Jones' opinion that the removal of a large part of the scapula for disease is a more dangerous operation than the removal of the whole bone. It is suggested by this author, I believe, that the subject of Mr. Liston's case of removal of three-fourths of the scapula, with nearly fatal hemorrhage, would have lost much less blood had the operation for the removal of the whole bone been properly practised.

While, unfortunately, no new light upon the pathology or the prognosis of operations performed for cancerous disease is afforded by this table, it stimulates the brightest hopes for the operation of removing the scapula, preserving the arm, where the destroying disease is caries or necrosis. We are not, however, without hope even in unquestionably cancerous affections of this bone, while we have such cases as Syme's second and Mussey's first before us. It will be remembered that in the former the head of the humerus was first removed for osteo-cancer; and recurring in the scapula and clavicle, the former bone was entirely removed, together with the outer end of the latter. This is the case which Mr. Fergusson quotes in high terms of eulogy. This patient was enjoying a useful life years after the last operation. The malignant character of the disease in Mussey's case was sufficiently shown by its having returned after two operations, which had removed the arm. The third operation carried away the scapula and clavicle; and thirty years after this last operation, the patient, who had then become an old man, still led an active and useful life—a living example of the triumph of persistive surgery over malignant disease. A cancerous

disease of the scapula does not, therefore, present any hopeless obstacle to the operation of removing the bone. The operation performed in the case which served as an introduction to this paper was then justified, so far as the question of the malignant element of the disease is concerned. That it was of the most malignant nature, the microscopic examination of the primitive tumour, and the rapid growth of the recurrent one, left no shadow of doubt. Its removal was, therefore, undertaken with the almost certainty that it would again recur, but still with the hope that it might not.

The operation being then most probably only palliative, the query very naturally arises, were the risks attending it counterbalanced by such prospective temporary benefit? In reply, we have the facts—first, that, on account of the pain and the oppressive weight of the tumour, the health of the little patient was so rapidly failing that even the parents regarded some operative procedure necessary to prolong life; second, that as no other organ, and only one or two glands were at all complicated in the disease, it appeared at least possible, if not probable, that the removal of the entire diseased mass would afford a relief from the disease for a time, if not permanently. This hope, it must not be forgotten, was much strengthened by the histories of Mussey's and Syme's cases.

Now, as regards the immediate danger of the operation, so much feared by surgeons, this does not appear to me to be great. In the first place, there is no anatomical reason why it should be so. I am convinced that Velpeau overestimated these anatomical difficulties. He says, in speaking of the scapula, "But it is so surrounded by thick muscles, that at first sight it would appear difficult to effect its resection." The fact, however, is that this bone is not surrounded by muscles remarkable for their being thick; on the contrary, they are thin. It seems hardly necessary to remark that the trapezius, the chief muscle attaching the scapula to the skeleton, is a broad but thin muscle. It is next followed by the rhomboidei and the levator muscles, and all together form a broad but thin band of muscular tissue. This, together with the scapular portions of the deltoid, and the tendon of the serratus magnus, compose all the muscular structure of any consequence which is divided in the operation for removal of the scapula. All else is areolar tissue, integument, vessels, nerves, and tendons. Among the last may be mentioned the tendons of the pectoralis minor, of the biceps, of the omo-hyoid, of the scapular, and of the teres muscles. These altogether are tissues of very moderate extent. No very important vessels are involved, and the hemorrhage is easily controlled. Probably more than half of all the tissues to be divided in this operation are met with in the scapular portion of the deltoid. It is, therefore, quite clear that there is no other bone of the human frame, of the size or weight of the scapula, whose removal involves less injury to muscles, nerves, and vessels, and certainly the loss of no one as large is followed by less disability. Death from shock, therefore, is very unlikely to occur, and from hemorrhage is

easily avoided. Indeed, we have already seen that, practically, no death from shock or hemorrhage has yet occurred in a case where the entire scapula has been removed. It will be recollected that death resulted in about one in four and a half of the cases in which the greater part of the scapula was removed, showing that the removal of the entire scapula is a less dangerous operation than the removal of a part of it, inasmuch as in the nine cases of the former operation no death has taken place.

In estimating the probable constitutional depression which the removal of the scapula is likely to produce, surgeons appear to have been uninfluenced by the histories of many recorded cases of the accidents by which the arm, including the scapula, has been torn from the body by machinery. As a matter of curious and instructive history, I have prepared the subjoined statement of all the accidents of this character, the record of which I have been able to find:—

The first recorded case of tearing of the arm and scapula from the body is that of Cheselden. It took place in 1737. There was no bleeding of importance, no ligatures were used, and the patient made a prompt recovery. Belchier is reported by some authors to have seen a similar case about the same time, but it is much more probable that his report referred to Cheselden's case. (*Philosophical Transactions*, vol. xl. p. 313.)

The second, or at least the next, case is one reported by Clough in 1779, of a girl of 11 years, whose arm and scapula were torn away. She was discharged well in two months. (*Ibid.*)

The third case was recorded by the late Dr. Mussey. It occurred in 1819. The subject was a boy of 16 years of age. It having been declared by the witnesses of the accident that the whole machinery of the mill was for a moment stopped by the body of the boy coming between the belt-wheel and the beam above, and that the next moment the arm gave way and the machinery went on, Dr. Mussey instituted experiments to ascertain how much power, as represented by lifting weights, was necessary to stop the machinery, and ascertained that about 840 pounds would stop it. He therefore concluded that it took a force of about 840 pounds to sever the scapula and arm from the body. The amount of blood lost was estimated by Dr. M. at less than a pint; no ligature was employed, and the patient was well in eight weeks. (*Am. Journ. of the Med. Sci.*, 1837, vol. xxi. p. 387.)

The fourth case, quoted by South in his edition of Chelius, occurred about 1830, in a boy of ten or eleven years of age. It is reported by Mr. James. No hemorrhage of consequence took place, no ligatures were applied, and the boy was well in nine weeks.

The fifth case is recorded by Scarnell as having occurred in 1832. It occurred in a boy of 13 years of age. This surgeon thought it necessary, in dressing the wound, to remove the outer third of the clavicle. He also, as a matter of precaution, secured the vessels by ligature, though little bleeding had occurred. He states that the general health of the boy was little affected by the accident, and he was running about in a fortnight. (*Lancet*, 1832, vol. xxii.)

The sixth case is reported by John Braithwaite in the *London Medical Gazette* for 1833. It occurred to a boy of 12 years. There was little bleeding until the surgeon disturbed the pulsating artery with the forceps,

when a violent gush of blood took place. It was at once secured by ligature. Very little shock was experienced, and recovery was early effected.

The seventh case, recorded by Lizars, included the outer half of the clavicle, which was torn away with the scapula and arm. There was little bleeding, but, as a precautionary measure, the subclavian artery was ligated. Recovery was prompt. (*South's Chelius.*)

The eighth case is reported in the *New York Medical Journal*, vol. i. p. 284, by Dr. Cooper. It occurred in a boy of 7 years of age, whose arm and two-thirds of the scapula were torn away by machinery. The outer third of the clavicle being exposed, was removed, and the remaining third of the scapula was dissected out. There was little bleeding and little shock. Recovered rapidly.

The ninth case was reported by Dr. King, of Glasgow, in 1845, in the *London and Edinburgh Journal*. It was a case whose main points were almost exactly like those of Lizars' above quoted. Recovery was rapid.

The tenth case is recorded by Cartwright, and quoted by Fergusson and others, but whose date I have not been able to find. It consisted in the tearing off of the arm and scapula. There were no untoward symptoms, and recovery was prompt.

The eleventh case is recorded by Dr. Lowe, of England, in the *Lancet* of November, 1867. It occurred in 1866, in a boy of 18 years, and was a loss of the arm and scapula. Very little hemorrhage, though at the dressing the subclavian artery was tied, as a matter of additional safety. The boy was well in a month.

Besides these cases, Mr. Fergusson makes the statement that Dorsey, Carmichael, and others have recorded similar cases. But I do not find any such record in Dorsey's *Surgery*. He there simply quotes Cheselden's case, to illustrate the effect of lacerating and stretching the arteries in preventing hemorrhage. Had he seen such a case at the time of writing, it seems most likely that he would have mentioned it in the same connection. Carmichael's case was one in which the arm was torn off a little above the elbow, and not above the shoulder-joint. In consequence of the injury to the tissues of the arm, however, it was thought best to amputate at the shoulder-joint. The patient recovered promptly, though only three and a half years old. (*Medical Facts*, 1791, vol. ii. p. 18.)

It will be observed that these cases have been uniformly attended by little loss of blood, and by remarkably little shock. No ligatures were employed in most of them, because there was no hemorrhage requiring them, and recovery has been uniform.

Impressed with the remarkably favourable terminations of his and of so many other similar cases, Dr. King observes that "these cases appear to justify a very favourable prognosis; but it must be recollected that while fortunate cases are sure to find their way into circulation, those of an opposite character are equally certain to be allowed to fall quietly into oblivion." He fails, however, to produce a case in support of this reflection upon the profession, and I have not been able to obtain the history of a single one. He also attempts to show, by citing two cases of tearing off of the lower extremity, which were followed by remarkably little shock

that this fact is not peculiar to the upper extremity, and that we must account for it in the sudden and violent manner of its performance. He infers, therefore, that if the amputations of the surgeon could in some manner imitate the machine process, the results would be better. I do not regard the cases he cites as at all comparable to the accidental tearing away of the arm and scapula.

One, for example, was that of a boy of 12 years, described by Mr. Carter, whose leg and thigh and part of the scrotum were torn away. Mr. Carter says: "When I attended, which was immediately after the accident, I found him on the floor, covered with a blanket, and, seemingly, free from pain, or any anxiety further than what appeared to proceed from the trouble his parents were in in consequence of the accident." (*Medical Facts*, 1791, vol. ii. p. 18.)

The description of the above case shows that it was not a tearing away of the thigh from the pelvis, but a separation of the thigh in the upper third, of which the patient died on the fifth day. The other case cited by Dr. King was that of a boy of nine years, whose leg was torn from the thigh at the knee-joint, and who was soon after found by the surgeon, suffering but little discomfort, but very much afraid that his parents would scold him. What finally became of this boy, I have not been able to ascertain. They are, therefore, not cases to be compared with the evulsion of the arm and scapula. They can only be compared with Mr. Carmichael's case, in which the arm of a little girl of three and a half years was torn off above the elbow, and the soft tissues of the arm so much injured as to require amputation at the shoulder-joint, which was done immediately, and the little patient was discharged cured in about two months. Indeed, I know of no records which will enable us to compare evulsion of the thigh with that of the arm and scapula. As to Dr. King's idea that machinery amputation is less fatal than when performed by the surgeon, our statistical table shows that the surgical amputations above the shoulder-joint have been remarkable for their low mortality; and could we obtain the cases which Dr. K. thinks may have sunk into oblivion, we might perhaps find that surgical amputations of this character have quite as low a mortality as those performed by machinery.

These cases do in fact teach us a practical and very instructive lesson. We learn from them that so severe a mutilation as tearing away the arm and scapula from the body is not attended by any dangerous degree of shock; and further, that when exsection is added to this accident, as in Cooper's case, or amputation at the shoulder-joint, as in Carmichael's case, the shock is not dangerously augmented. Indeed, we are apparently authorized by this exhibit, in connection with the table accompanying this report, in concluding that amputations above the shoulder, whether by machinery or by the knife, are little, if at all more dangerous than amputations at the joint. Now, if the removal of the arm and scapula from

the body is attended by so little shock, is it not fair to infer that the removal of the scapula alone, which requires far less mutilation, would be attended by still less shock? Practically, this inference has been supported by experience, as this table shows. Early death appearing inevitable, as it did in the case I have related, the operation of removal of the entire diseased bone was therefore not opposed by any grave immediate risks of life. This being true, it was justifiable, as we have before seen, even in the face of very decided chances that the disease would return. The following remarks of Mr. Paget, made upon the occasion of removal of part of the scapula for cancerous disease, are very applicable to the above conclusion:—

“In many cases we must operate almost against hope, with a very little probability of recovery. When uncertain as to the character of the disease, the grounds for operation are all the stronger.”

These are his sentiments with reference to unquestionably cancerous disease of the bone, which he remarks are sure to return, though there is generally a period of immunity from it. He illustrates the propriety of operating in malignant disease of the bones by the relation of two cases, in one of which death at last terminated prolonged and extreme suffering from a tumour in the upper portion of the thigh. It had been let alone upon the diagnosis that it was cancerous, and after death it was found to be cartilaginous. The other was a cystic disease of the femur, similarly diagnosed. He thought the lives of both patients might have been saved by removing the limbs affected. These remarks, however, do not apply fully to the case I have recorded, for the character of the disease could not be doubted, the primary growth having been examined. Almost exactly the same circumstance existed in Dr. Hammer's case, the only difference being that the interval between the primary and final operation being but a few days in Dr. Hammer's case, instead of a few months, as in mine. An undoubtedly better proceeding in both cases would have been to extract some fragment of the tumours for microscopic examination by an appropriate instrument, before proceeding to any formal surgical operation. This, however, could be of little service except as a means of making up a prognosis, unless applied to directing the manner and extent of the operation, which is to follow. I regard it as a very grave mistake that the entire scapula was not removed, in the case I have reported, at the first operation. Had the microscopic character of the tumour been correctly ascertained, no operation but the extirpation of the entire bone would have been practised; and there can be no doubt that had it been removed at that early date, the chances of more permanent relief would have been increased.

This remark introduces the subject of the propriety or safety of removing a part only of a bone affected with cancerous disease. Mr. Paget, after a most matured experience in the matter, asks if, “in cancer of the

bone, it be sufficient to remove the part affected, or should we take away the whole bone?" To this query he replied that "if the removal of the whole bone does not increase the risks to life, do it; but, if otherwise, remove only the part affected." We have already seen that, according to the records of operations upon the scapula, the removal of any considerable portion of it is a more dangerous operation than the extirpation of the entire bone. The scapula in this case, therefore, should have been extirpated at the time of the removal of the first tumour. It will probably be noted that no allusion has been made to the subject of the comparative usefulness of the arm in case of the removal of all or the greater part of the scapula. The details of the records upon this point are too meagre to afford the means of a very definite conclusion. Mr. Luke's case, operated upon in 1828, is the most satisfactory one as to the results after removing the greater portion of the bone. Three-fourths, it is said, was the amount removed, measuring from behind forward. This patient is reported to have afterwards become the mother of a numerous family, and to have been able to use the arm nearly as well as the one of the sound side, though the disease was supposed to be malignant. Unquestionably the most favourable report of any case in which the entire bone was taken away, was that of Mr. Jones. We have a report as late as six years after the operation, when she had a most useful arm, and a very moderate degree of deformity. So far, then, as experience goes, we have no reason to think that the utility of the arm is much, if any increased, by leaving a piece of the scapula, including the glenoid cavity. Anatomically, I cannot see why we should expect that the glenoid cavity, deprived of all, or nearly all of its muscular and tendinous supports, could be of much value in securing the usefulness of the supports to the head of the humerus. I regard it as a piece of mutilated bone, more likely to give trouble than to be of any future service. Again, Mr. Fergusson advocates the plan of leaving the acromion process, when it can be done, on the ground that it helps to maintain the utility of the deltoid, and to preserve the contour of the shoulder. The latter result must, of course, depend upon the presence of the head of the humerus beneath it. It may be a fair question, however, with the surgeon, whether any such advantages as Fergusson claims for the preservation of the acromion, is not more than outweighed by the risk attending it of leaving contaminated bone. Influenced by the knowledge upon the subject which my investigations have furnished me, I would decidedly prefer the removal of the whole bone, rather than a part of it, in cases of malignant disease, particularly if a very considerable portion of it were involved in the growth. The grounds for this preference are—

First. That the results are quite as good as to the future usefulness of the arm.

Second. That the dangers attending the operation are scarcely ever greater, generally less; and,

Third. The liability of the disease to return is probably less. In cases of necrosis and caries, however, these principles are not applicable, as the history of Dr. Walter's and other similar cases show. In these cases the plan very clearly is to remove little if any more than the diseased tissue, and to avoid the carrying away of periosteum as carefully as possible, for as in Walter's and other similar cases alluded to in the table, a more or less great part of the bone may be reproduced. It will add to the interest of this point to quote Dr. Mussey's statement regarding the reproduction of bone in his case of tearing away of the arm and scapula before related. He says—

“A year after the injury I saw the patient, and found a bony plate, apparently about three-fourths of an inch wide, taking such a course as to represent the marginal parts of the entire body of the scapula, firmly adherent to the muscular parts beneath the skin. This triangular bony frame could be moved upward and downward, backward and forward, by a voluntary motion of the muscles attached to it.” (*American Journal of Med. Sciences*, 1837-8, p. 386.)

In conclusion, it may be summarily stated that the exsection of the entire scapula, with preservation of the arm, is an operation of very modern date, first performed, so far as the records have informed us, in 1855.

The following abstract from our main table will exhibit an outline of the nine, and only cases, known to the history of surgery:—

Langenbeck, in 1855, removed the entire scapula and three inches of the clavicle.

Syme, in 1856, removed the entire scapula and no more.

Heyfelder, in 1857, removed the scapula; at the same operation the head of the humerus was also removed.

Jones, in 1858, removed the entire scapula and about an inch from the outer end of the clavicle.

Hammer, in 1860, removed the entire scapula and about three-fourths of an inch from the clavicle at its acromial end.

Syme, in 1860, removed the entire scapula and outer end of the clavicle, the head of the humerus having been removed at a previous operation.

Schub, in 1860, removed the entire scapula and no more.

Michaux, in 1864, removed the whole scapula and no more.

Rogers, in 1867, removed the whole scapula and no more.

The legitimate surgical character of the operation is no longer a subject of doubt, and we are not now liable to the criticism which was so severely bestowed upon Mr. Syme in 1856, for having practised an operation which, at best, must leave a worse than useless arm, as was alleged. On the contrary, it is practised and defended and urged with enthusiasm by the highest surgical authority as the *ne plus ultra* of conservative surgery.

There is no anatomical or pathological reason why the scapula should not be removed for any disease of the bone, which sound surgery would make it expedient to remove any other bone in the frame for, and in malignant disease of this bone, it is safer and better surgery, as it is in similar disease in all bones, to remove the whole rather than a part. The prog-

nosis of this, or any operation upon the scapula, as to the life of the patient is quite as good as in all similar operations upon the principal bones of the body, and much better than in some. The laws of pathology governing cancerous disease of the bones are just as true in the case of the scapula as elsewhere; and so of caries and necrosis. The prognosis as to the value of the arm in case of removal of all, or a part of the scapula, may be almost positively, and to a high degree, favourable. In fact, if the operation saves the life for any considerable time, as well as the limb, the latter is nearly certain to be useful. In many of the cases recorded it has been so to a remarkable extent.

For facilities in obtaining the material for this paper, I am under especial obligations to Drs. S. S. Purple, E. Krackowizer, A. Jacobi, Stephen Smith, M. Blumenthal, of this city, and Dr. Marsh, U. S. A., and for very valuable assistance to Dr. J. G. Frazer, of this city.

NEW YORK, Aug. 4, 1868. 249 W. 42d St.

ART. VI.—*Remarks on Traumatic Hemorrhage, with Cases.* By PHILIP HARVEY, M. D., late Surgeon U. S. V., Burlington, Iowa.

THE means of arresting traumatic hemorrhage have the strongest claims for investigation. How far compression and styptics may be relied on, when to have recourse to operative interference, and what operation to perform, are continually recurring questions. When the bleeding cannot be controlled by other means, the rule of securing the wounded artery by ligatures above and below the wound in it, is doubtless the safest one; and, when the wound is recent, should be adopted, when we have the option, even if the hemorrhage for the time being is restrained. But it is sometimes impossible to reach the vessel at the wounded point, and we must of necessity depend on other resources. When many days have elapsed from the receipt of the wound, the flow of blood ceased, and we have in fact an increasing traumatic aneurism to treat, not external hemorrhage, I think the Hunterian plan of procedure, of tying the artery at the place of election above the wound, will usually be found the most eligible; for besides being efficacious, it can be had recourse to with comparative facility in most cases, and occasions less injury and disturbance to the parts implicated. If the means used by nature for arresting the flow of blood are for the time effectual, though there may have been recurring hemorrhage, or though the consequent diffused aneurism may be increasing and threatening a speedy rupture, still, as these natural barriers are able to stand against the direct current, they will, *à fortiori*, be able to control

the more feeble reflux from the lower orifice, if that should remain open; though after some days have passed from the receipt of the injury there is a probability that the lower orifice may have become cemented, a probability that increases with the lapse of time. In cases of this kind I am inclined to think it safe and proper to rely on cutting off the flow through the main channel above, without disturbing the wounded parts, or interfering with the cyst, if such should be deemed the easiest mode of procedure.

In some cases of alarming secondary hemorrhage from gunshot wounds, where the bleeding orifice could not be reached, and where it was impossible to determine the source, especially when it came from beneath the scapula, I have found satisfactory results from the use of lint dipped in the solution of persulphate of iron carried well down to the bleeding vessel by means of forceps, and left there till loosened by suppuration; but I would not recommend a reliance on styptics in cases of serious hemorrhage, when the bleeding vessel can be reached and tied.

I am induced to make these remarks, and to send you the two following cases that occurred under my observation in South Kansas, in 1864, when I was acting as medical director of that military district, by reading some cases of traumatic aneurism in a late number of this Journal.

CASE 1. B. C., aged sixteen years, was accidentally shot in the left groin by a revolver, on the 22d of August, 1864. The ball entered immediately on the outside of the femoral artery, and ranging downwards and outwards came out behind the external vastus at the lower third of the thigh. The hemorrhage was copious, and he fell in a state of syncope before he could proceed many yards towards the house. He was found lying in a state of collapse about half an hour afterwards, and carried home, where by the use of stimulants he revived. During the subsequent night he again sunk into a state of protracted syncope; when I was sent for. I found him pale, pulseless, and unconscious, with the upper part of the thigh distended by extravasation, though there was no external bleeding. I applied compression on the artery at the groin, and made use of stimulants. By morning reaction had again taken place. As the tumefaction was extending above the groin, the pad there was removed on the supposition that it was doing more harm than good by pressing on the vein. For two or three days he appeared to be doing well, when a pulsating tumour was observed below the groin, in the track of the femoral vessels, attended with a very decided bellows sound. This continued to increase for several days, and the limb became painful from distension. An oozing of dissolved blood from the upper wound now hinted that much further delay might not be safe, and I counselled an operation; not knowing, however, whether it would be best to search for the wound in the artery or tie above, I intended the operation to be exploratory at first, and afterwards to act as circumstances should indicate. It was not till the first of September that the friends would consent to the operation; it then was evident to all that something must be done. Having administered chloroform, I divided the integuments and fascia lata from the edge of the sartorius to the bend of the groin, over the usual course of the femoral artery, its pulsation being undistinguishable from that of the tumour. The incision proved to be half an inch on the

outside of the artery, which was beating very feebly. There were some tenacious coagula among the muscles, and those forming the sac appeared also tough. The femoral artery was separated from its attachments beneath by the tumour, and pressing it between the thumb and finger, a little below the groin, did not stop the pulsation in the cyst; I therefore explored further up and found the profunda given off immediately below the crural arch; it merged directly into the pulsating tumour, so that I did not think it safe to trust a ligature so close to the bifurcation, and therefore passed the thread around the common trunk. The sac extended deep down beneath the rectus, out of sight and reach, and it appeared an alarming undertaking to lay it open in search of the wounded vessel. This might have been the profunda, or it might have been the external circumflex close to the profunda. Pulsation ceased on tightening the thread, and the wound was closed. The profunda evinced stronger pulsation than the femoral, the latter being compressed by the tumour and pulsating feebly. For many days after the operation the weather was sultry, and the limb sustained but little diminution of temperature. He lost no blood during the operation, and improved rapidly after it. On the ninth day the ligature came away, and on the fifteenth a large slough composed of the debris of the aneurismal cyst was drawn out by the forceps. After this the wound closed up rapidly. The last I saw of the case, about a month after the operation, the only thing the matter with the limb was a slight difficulty in straightening it from contraction of the cicatrix at the groin—the spot at which the ball entered. He was nevertheless able to walk about, and I doubt not entirely recovered the use of the limb in a short time.

CASE 2. Private D. D., Company "C," Third Wisconsin Vol. Cav., was wounded in the right forearm, by a pistol shot, at Hickman's Mills, Mo., on the 17th of October, 1864. The ball entered on the dorsal aspect of the limb, about midway between the wrist and elbow, and passing between the radius and ulna emerged at the upper part of the forearm, on its palmar aspect, near the outer condyle of the humerus. There was considerable arterial bleeding at the time, and as there was no pulsation of the radial below the wound, I supposed it to be divided somewhere near the bend of the arm. The hemorrhage was controlled by pressure; and as we were under marching orders, the man was sent to the general hospital at Kansas City, distant about twelve miles. I saw him there a week afterwards, after the battle of Westport, when I went to Kansas City to make arrangements for the reception of our wounded. The forearm was then greatly swollen and painful, the tumefaction pulsating strongly from the bend of the elbow half way down the forearm. Though he was under the care of the surgeon in charge of the hospital, Act. Asst. Surg. Geo. H. Hood, U. S. A., I saw the man daily for a week. On the night of the 28th of the month hemorrhage recurred with considerable violence, spouting from the upper orifice; this was restrained by a pad and bandage over the brachial. He could not, however, bear sufficient pressure to command all pulsation in the limb. Under these circumstances I recommended putting a ligature round the brachial at the middle of the arm, and at the request of Dr. Hood, performed the operation on the morning of the 29th. With the assistance of the doctor this was accomplished without difficulty or accident. On tightening the ligature all pulsation in the tumour ceased, and soon after all pain subsided. The night after the operation he said was the first tranquil one he had passed since the accident. The next day

I followed the army southward, as there had been more fighting, and I received a telegraphic despatch that my services were needed. I saw no more of the case; but on the 23d of November I received a letter from Dr. Hood, dated Kansas City, Mo., Nov. 21, 1864, from which I make the following extract in reference to it:—

“I have deferred writing in reply to your favour of the 9th until now, that I might report progress in that interesting case of private D. The object sought for in his case has been attained. He did very well until the 9th or 10th of this month, when erysipelatous inflammation of the forearm supervened and gave a new interest and rather unpromising aspect to the case for a few days. He is now improving again, and I think in a fair way to make a good recovery. The ligature came away on the 12th. He is very grateful to you for the professional aid given him, and wishes me to give you this expression of it. Should anything occur different from what is now anticipated in the case, I will advise you of it.” * * * * *

I subsequently learned that the case progressed favourably to complete recovery of health and limb.

ART. VII.—*Account of a New and very Successful Operation for the Worst Forms of Cleft of the Hard Palate.* Illustrated by 17 figures and a brief analysis of 55 cases. By WM. R. WHITEHEAD, M. D., of New York.

THE term muco-periosteal uranoplasty is applied by German surgeons to a very successful operation for cleft of the hard palate. This operation is comparatively of recent origin, and well deserves the attention which it has received in Continental Europe. The interesting experimental essays of Flourens and others on animals for the reproduction of bone from the periosteum by the transplantation of this membrane, foreshadowed a series of brilliant successes in conservative surgery, suggesting many valuable and practical applications; but none bolder and stamped more plainly with the impress of originality than this method of Langenbeck for the closure of fissures of the bony palate. The feasibility of this operative procedure, is equalled only by the practical conception of utilizing the periosteum for the production of an osseous palatine vault in those unfortunate defects of the palate which heretofore have entirely baffled the most dextrous surgical skill. The opinion of Simon, of Rostock, concerning this subject, is especially important, not only as expressing his personal experience with the operation, but also as exhibiting the favourable results which have succeeded its repetition by other surgeons. He remarks:—

“Since the publication of Langenbeck’s method of muco-periosteal uranoplasty the number of successful results in this department of surgery can almost be numbered by hundreds, whereas before success was rather exceptional than otherwise. He further states that this method will certainly bear comparison with any other mode of operating, and thus far has not been materially improved

upon." (*Mittheilungen aus der chirurgischen Klinik des Rostocker Krankenhauses während der Jahre 1861-1865*, von Prof. Dr. Gustav Simon. Prague, 1868.)

Some surgeons oppose all attempts at operative interference in cases of cleft of the hard palate, and even staphylorrhaphy, on the ground that this operation fails to improve the speech. The evidence to the contrary is attested by too many successful results to permit assent to such opposition, which must necessarily have considerably less weight when not based on a knowledge of the recent progress made in this field of plastic surgery.

In this country Langenbeck's operation is almost unknown. My own experience with it thus far has been quite limited, but very instructive. Through the assistance of Drs. Elsberg and Van Gieson, who have kindly aided me with the German text, I have learned all the most important facts relating to the subject, and have collected a large number of cases which it is hoped will give additional importance to this communication. I am particularly indebted also to Dr. Krackowizer for loaning me the principal German periodical in which this subject has been appreciatively considered. It is generally conceded that the first attempt at staphylorrhaphy was made in 1816 by Graefe, of Berlin; but Bérard (*Dict. de Méd.*, en trente volumes. art. Staphylorrhaphy) attributes to a French dentist the merit of operating for fissured palate at a period anterior to that date. In France, in 1819, Roux (Sédillot, *Traité de Méd. Opératoire*, tome second, 2ème édition, p. 52) successfully accomplished the operation on a young physician, Dr. Stephenson, who read the report of his own case before the French Academy of Medicine, eliciting an enthusiasm which presaged the most pleasing success for staphylorrhaphy. The names of Dieffenbach, Mettauer, Mütter, J. Mason Warren, Pancoast, Fergusson, Sédillot, and many others have since become intimately associated with staphylorrhaphy, which has usually been restricted to a small proportion of cases of congenital defect of the palate, eight or nine-tenths of such defects being accompanied with cleft of the hard palate, the closure of which has many times ineffectually exercised the ingenuity and patient skill of surgeons in this and in other countries.

One of the most notable exceptions to this, however, is the successful case of J. Mason Warren.¹ The occasional and partially successful closure of cleft of the hard palate heretofore, has only served to mark the uncertainty of such attempts which most generally have not been based upon a correct view of the principal points to be observed in preserving the vitality of the detached parts. When this precaution has been properly taken, a partial success has sometimes followed the detachment and union of the opposite mucous surfaces of the cleft, especially facilitated by a right formation of the flaps. This has been in a few instances the case with Pollock,²

¹ Am. Journ. of the Med. Sciences, July, 1843, p. 257.

² Medico-Chirurg. Trans., vol. xxxix. p. 71.

and later, with Baizeau¹ in his restoration of acquired defects of the palatine vault. But to Langenbeck² alone is due an eminently successful procedure which preserves the nutrient vessels uninjured and includes the periosteum in the flaps with a view to the ultimate reproduction of bone to close the fissured vault.

The controverted subject of the reproduction of bone has but quite recently received increased attention by the publication of the exhaustive treatises of Sédillot³ and Ollier,⁴ in both of which works is discussed the subject of the reproduction of bone after muco-periosteal uranoplasty.

To facilitate the description of Langenbeck's method, it is very necessary to recollect the peculiar distribution of the arteries which supply the roof of the mouth. There are three vascular points to be carefully respected in making the incisions and detaching the soft parts.

These points correspond to the angles of a triangular space occupied by the horizontal processes of the superior maxillæ and palate bones, the apex of the triangle being at the foramen incisivum and the other angles corresponding to the inferior openings of the posterior palatine canals. It should be recollected that the speno-palatine and superior or descending palatine arteries are the terminal branches of the internal maxillary artery: The superior palatine in passing down the posterior palatine canal, before emerging, gives off branches which descend in the small accessory palatine canals to supply the soft palate and anastomose with the ascending palatine, a branch of the facial. The descending palatine then runs forward in a groove on the inner side of the alveolar border of the hard palate, and is distributed to the mucous membrane and periosteum of the hard palate and gums, but continues forward to the anterior palatine canal, through which this artery passes upward to anastomose with the one on the opposite side, and with the artery of the septum nasi, a branch of the naso-palatine. The superior palatine artery in its horizontal portion, which extends from the posterior to the anterior palatine canal, is far from being of inconsiderable size, and if cut, may give rise to troublesome and dangerous hemorrhage, and will occasion gangrene of the detached parts.

One of the little terminal branches of the ascending or inferior palatine artery, after passing between the levator and tensor palatores muscles, curves backward and downward, and is in relation with the inner border and posterior surface of the levator palati, and the knife, in dividing this muscle in staphylorrhaphy, cuts this artery occasionally, causing some

¹ Mémoire sur les perforations et les divisions de la Voute Palatine, Arch. Gén. de Méd., Decembre, 1861.

² Arch. für Klin. Chirurg. II. Band Erstes und Zweites Heft, Berlin, 1861; also Arch. Gén. de Méd., 5ème série, tome 19, pages 271-567 and 709.

³ De l'Évidement Sous-Périoste des Os, p. 52. Paris, 1867.

⁴ Traité Expérimental et Clinique de la Régénération des Os, et de la Production artificielle du Tissu Osseux, vol. ii. p. 474.

hemorrhage, but which is generally checked without much delay by gargling with ice water.

Usually in previous attempts at closure of fissures of the hard palate, the flaps which were detached with much care and difficulty were deficient in nutrient vessels, and gangrene necessarily resulted, causing in some few cases such destruction that doubtless the patient's deformity has been increased instead of lessened. The livid appearance of the part which succeeds when the superior palatine is cut is immediate, and the vascular reticulum within the substance of the flap being separated from its connection with the subjacent bones, the quantity of nutrient blood circulating in the detached part is altogether insufficient, and failure of the operation will nearly always ensue. But sometimes, however, when the detachment has not been too extensive, and the proximal part of the flap is well nourished, its distal portion may receive sufficient blood to maintain its vitality.

Langenbeck has been enabled by his operation so thoroughly to separate and approximate the soft parts, at the same time preserving the nutrient vessels intact, that the two operations, uranoplasty and staphylorrhaphy, or closure of the cleft in the hard and soft palate, have been repeatedly accomplished in one operation by different surgeons.

Different Forms of Congenital Cleft Palate.—The diversities of form observed in congenital deficiencies of the palate are so numerous that no two cases are entirely alike. Langenbeck divides congenital defects of the palate into those which are complete and those which are partial. He remarks :—

“Complete cleft of the palate embraces those varieties which are designated *medium*, *bilateral*, and *unilateral*. The medium cleft is the most infrequent variety: In this form the upper lip and soft palate are split in the mesial line; the intermaxillary bones, vomer, and nasal septum are entirely absent, and the palate processes rudimentary. The *bilateral* form of cleft is nearly always complicated with double hare-lip and a medium cleft of the velum palati. The palate processes of the superior maxillæ are imperfectly developed, and exist only as two very narrow longitudinal ridges; the vomer is seen in the middle. Sometimes there is incomplete development of the left intermaxillary bone with smaller incisors than on the right side. Occasionally there is an excessive development of the vomer at its anterior part, causing the intermaxillary bones to protrude in a very prominent manner, which adds to the unsightly deformity. Sometimes, especially in new-born children, there is a fissure between the intermaxillary bones. The *unilateral* form of cleft is not infrequent, and is nearly always accompanied with a median cleft of the velum palati, and with simple or double hare-lip. The cleft of the palate is nearly always on the left side of the vomer; the upper lip of that side is entirely split, and when the hare-lip is double, the cleft of the lip on the right side is less than that on the left. Most frequently in this form of split palate the left ala of the nose is buried in the cheek. There is complete development of the left maxilla. The palatine process of the right side, instead of being horizontal, rises nearly perpendicularly in following the direction of the alveolar border, and is continuous with the nasal septum formed principally by the vomer. The left palatine process is represented by a narrow horizontal ridge. Langenbeck states that it has been erroneously supposed that the excision of the intermaxillary bones, in cases of bilateral cleft, does not really produce an important loss of substance,

while facilitating very much the operation for hare-lip, but subsequently, however, there is a defective development of the upper jaw in its antero-posterior direction, and the approximation of the cleft anteriorly is followed by a corresponding divergence posteriorly. Lateral compression in lessening the cleft, produces likewise a deformity of the upper jaw.

"*Partial cleft of the palate offers a very great variety of forms; but the following are some of the principal:—*

"1. *Complete cleft except the alveolar process.* This variety may be bilateral, unilateral, complicated or not with hare-lip and cleft of the velum palati.

"2. *Cleft of the velum extending to the middle of the palatine vault.* This is an infrequent form.

"3. *Cleft of the horizontal processes of the palate bones.* This variety is as frequent as the division of the soft palate which accompanies it."

Langenbeck's Method.—The sitting posture may be selected to prevent the patient from swallowing too much blood; but the detachment of the muco-periosteal membrane can be more conveniently done while the patient is reclining. The use of chloroform is exceedingly inconvenient, and may be attended with considerable danger. But should it be absolutely required to give this anæsthetic, previous to its inhalation the most troublesome incisions should be made, and all hemorrhage controlled. Langenbeck remarks, that if chloroform be administered, a mouth speculum is indispensable. A piece of cork, having a string attached, may be placed between the teeth, and will be quite sufficient to permit the detachment of the periosteal covering. Since the publication of Langenbeck's first article¹ he has, in a more extended and important paper,² illustrated his operation by wood-cuts (see Figs. 1–5), which will exhibit more clearly some of the important stages of his procedure. The diffuseness of the original articles will not permit me to follow the author through all the details, but I shall endeavour, consistent with conciseness and clearness, to omit nothing of essential importance. Fig. 1, though only intended to illustrate his first form of cleft palate, and the side incisions, will aid in the general description of his method, which is divided into the following stages: The paring of the edges of the cleft; division of the palatine muscles; making the lateral incisions; the detachment of the soft parts; and, finally, the passage of the sutures.

The first form of cleft, as shown at Fig. 1, supposes an exactly median cleft of both the hard and soft palate, of moderate width, and having a ledge of bone which represents the horizontal processes of the maxillæ and palate bones. The operation is commenced by paring the edges of the cleft from the tip of the bifid uvula to the junction of the fissure anteriorly. The soft palate is held tense by a pair of forceps, and pared with a double edge lancet-shaped knife. Afterward the incision along the edge of bone, as indicated at *B*, is made through the periosteum, and one or two lines from the fissured edges, with small bistouries, having each a thick blade and convex cutting edge. The section of the muscles which elevate the soft palate, as described in his first article, is done with a sickle-shape tenotome knife (Fig. 2), which is thrust with the cutting edge upward into the soft palate, just below and little to the outer side of the hamular process, transpiercing the velum palati so far as to extend nearly to the

¹ Arch. für Klin. Chirurg. II. Band, I. & II. Heft. Berlin, 1861.

² V. Band Arch. für Klin. Chirurg.

posterior wall of the pharynx. This thrust being made obliquely backward and inward, the velum is then cut in its entire thickness as far as the posterior border of the palate bone. For thoroughly detaching the soft palate from the

Fig. 1.

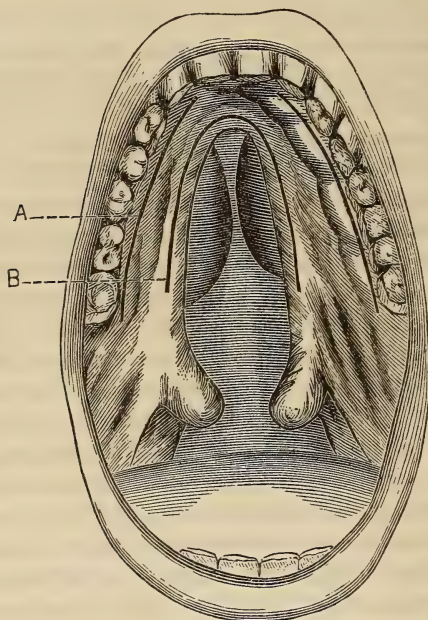


Fig. 2.

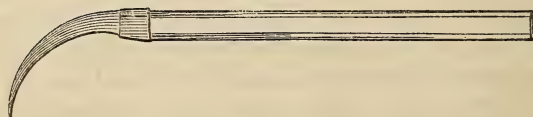


Fig. 3.

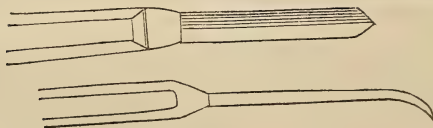


Fig. 4.



inner pterygoid plate, Langenbeck, at a later period, made use of other instruments (Figs. 3, 4). Fig. 3 represents a side and front view of a double edge, sharp-pointed knife, slightly curved near its point; and Fig. 4 a side and front view of a double-edge knife, curved in the same manner, but slightly knobbed at its distal extremity.

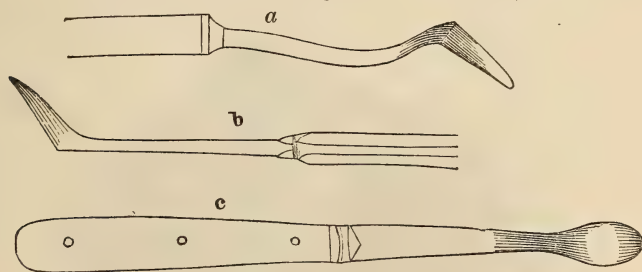
These knives are very convenient for thoroughly making the necessary detachment of the soft palate from its bony connections. The lateral incisions, as indicated at *A* (Fig. 1), and in this form of cleft, commence near the hamular process on each side, and extend along the inner side of the teeth to the space between the lateral and middle incisors. These side-cuts divide the mucous membrane and periosteum to the bone, being separated in front by a pedicle of gum tissue, which remains undetached, and corresponds to the anterior nutrient point from which the flaps receive a supply of blood. These lateral incisions, which are made with the knife (Fig. 5), are continuous with the incisions previously made in the soft palate, and which divided the palatine muscles.

Fig. 5.



In the next stage of the operation, the detachment of the muco-periosteal covering, *involucrum palati duri*, is commenced by inserting into the side cuts, represented at *A*, Fig. 1, an instrument (gaisfuss) of the shape seen at Fig. 6, *a*, *b*, *c*.

Fig. 6.



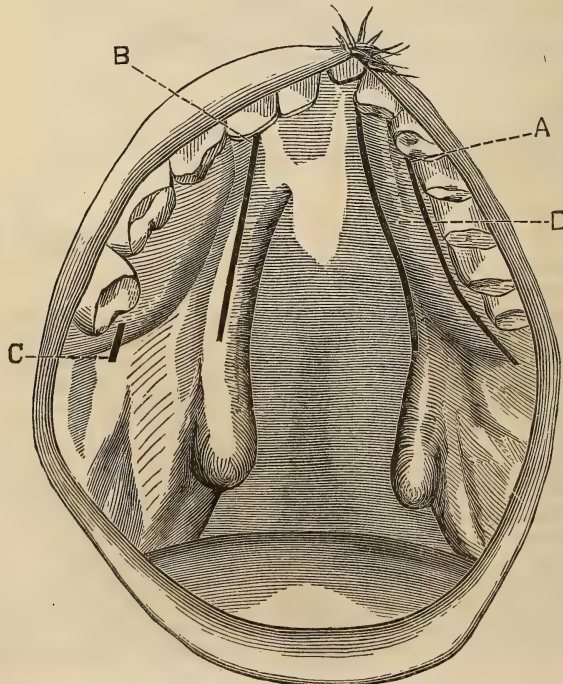
"Fig. 6, *a*, represents one with a curved shank, and *b*, *c* are side and front views respectively of the same instrument, but with a straight shank. The detachment of the periosteum being commenced with this instrument, is completed with blunt elevators represented by Figs. 15, 16. and 17, and the three nutrient points corresponding to the lower orifices of the posterior palatine, and anterior palatine canals, are carefully avoided. When the detachment of the periosteum has been effected as far as the posterior border of the palate bone, the velum palati becomes detached from the bone in the anterior half of its thickness; then the posterior mucous covering of the soft palate should be cut across close to the same bony border. The immediate effect of this detachment is to bring the flaps together without traction. The appearances are somewhat different according to the form of the congenital defect. But in such as is represented at Fig. 1, there are two narrow flaps, which are continuous in front with each other and with the alveolar border, whereas behind each one is continuous with the corresponding half of the soft palate. These flaps are thick, resisting, and so movable that their inner borders come almost in contact

before being united by suture. It may be incidentally mentioned that the denuded bone does not necrose, as some have thought, but is soon covered with a new periosteum. For the passage of the sutures, Langenbeck uses a needle such as is shown by Fig. 14. This instrument is represented half size. A spiral spring is contained within the handle, which is continuous with a hollow steel shaft, having at its extremity a straight spear-pointed needle, which is also hollow from the little disk separating it from the shaft, to a notch below the point. The needle, which is eight or ten lines long, forms an obtuse angle with the shaft that contains a small cylinder at the anterior extremity on which is soldered a very delicate spring of the most resilient steel, such as is used for watch-springs. The little disk at the distal extremity of the shaft, prevents this from following the needle when it has transpierced the soft palate. The needle being passed from before backward, when it is perceived to be in the cleft, the operator presses with his thumb on the disk of the handle, and the little steel spring, with its hooked extremity, projects from the notch in the canulated needle, and curves forward. An aid, with a suture prepared as is represented at Fig. 14A, catches the silk thread in the hook of the little spring. In gradually ceasing to press on the disk, the spring re-enters the canula, drawing the suture into it. Then, with the removal of the needle, is effected the passage of the suture through one of the flaps. The little spring is again made to project, the thread set free, and its other end passed in the same manner through the opposite flap.

"From ten to twelve sutures are required when there is a complete cleft of the hard and soft palate. The first should be passed at the anterior angle of the wound, and the last should unite the ends of the uvula."

Langenbeck uses for uranoplasty and for staphylorrhaphy, silk sutures, which are certainly of more facile use than metallic ones, but silver wire is

Fig. 7.

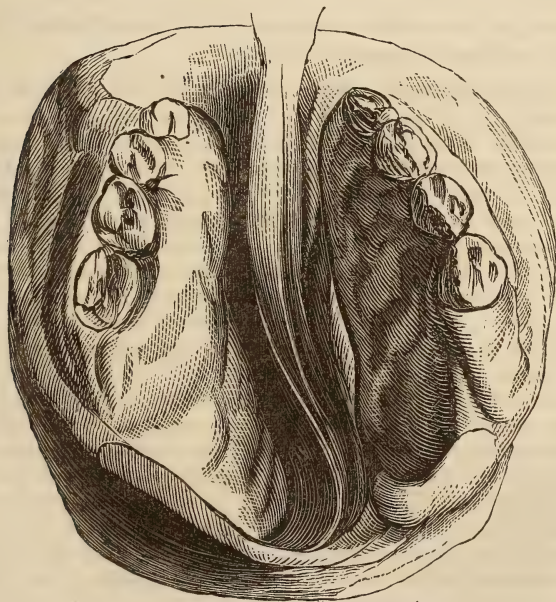


preferable. It is necessary to remove the silk threads on the fourth day, if not sooner. This is not the case with silver wire, which produces no irritation. Admitting that union of the parts be effected by this time, the advantages to be obtained in preventing undue strain on the newly-formed tissue which unites the flaps, is entirely lost by the early removal of the sutures.

The side incisions vary according to the nature of the cleft. The first form of congenital defect, illustrated at Fig. 1, I selected to aid in describing in a general manner the different stages of the operation. In the second form (see Fig. 7), Langenbeck observes that:—

“One of the borders of the cleft is nearly or quite horizontal, while the other ascends almost perpendicularly into the vomer and nasal septum. In these cases the operation upon the horizontal portion is the same as that described in the first method (Fig. 1, *A*), but the perpendicular portion requires quite a different procedure. The incision is made into the muco-periosteal covering just where it joins the nasal mucous membrane, *i. e.*, in the dividing line between the perpendicular ascending processus palatinus and the vomer. The incision extends the whole length of the cleft, from the velum to the gum (Fig. 7, *B*). The hook-shape raspatorium (Fig. 13) is introduced, and the muco-periosteal covering torn off for a short distance; the curved elevator is then inserted and the whole covering, together with the palatine curtain, stripped off from the inner surface of the alveolar process. This being done, this portion will immediately assume a horizontal position, forming a sort of valve, which remains

Fig. 8.



in connection with the alveolar process for its whole length and posteriorly with the curtain of the palate; the border of which can be brought in close contact with the flap of the other side. Only two of Langenbeck's cases were done after this method.

"In the third form of cleft, both halves of the palate are in a perpendicular position. The cleft is very wide, and in the middle of it the vomer can be seen lying free, running from behind forwards. The operation in cases of this kind is the same on both sides as that described for the perpendicular portion in the second method, *i. e.*, the incision on both sides is made at the line of junction, between the mucous covering and the nasal mucous membrane (see Fig. 8). The former is removed on both sides making the valve like flaps, which after having sunk down in a horizontal position will allow their free borders to come in contact. In order that the flaps may not yield and hang down too far in the middle line, it would be advisable to unite them at several points with the vomer. For this purpose the inferior surface of the vomer must be freshened by removing a very small strip of its mucous membrane. The sutures which are to fix the flaps to the vomer, are first passed through the border of the left flap, then through the soft parts of the under surface of the vomer, then through the border of the right flap. If the soft parts are insufficient and there is danger that the sutures may tear out, a single suture (the middle one) can be passed through the bony substance of the nasal septum. Three sutures at equal distances from each other, will be enough in any case. In cases where the vomer is situated very high up, it will not be possible to bring the flaps in contact with it, and yet, even in these cases, a few sutures will prevent the flaps from sinking too far down in the middle line.

"The first method can also be used in these cases, but it will be found difficult in this way to close the anterior angle of the cleft, and to do this a second operation will be required."

Concerning the instruments mentioned in the description of the operation, Langenbeck further remarks that:—

"The hook-shaped raspatorium (see Fig. 13) in most of the cases can be replaced by an instrument working upon the principle of a lever, which he calls the *Gaisfuss*, although the name is not exactly appropriate. This instrument is somewhat like the crow's foot of the dentists, being about one-third larger and wider, and instead of terminating in two claws, has an even, smooth, and almost cutting extremity. The form shown at Fig. 6, *a*, with a slightly curved shank, is the one preferred by Langenbeck.

"The hoe-shaped raspatorium is only indispensably necessary in those cases where the sides of the defect extend upward in a nearly perpendicular direction; where in removing the muco-periosteal covering we must begin at the border of the nasal mucous membrane, and especially in those cases where a certain amount of traction is necessary to tear off the periosteum. In all cases in which the periosteum can be *shoved*, *i. e.*, where the instrument can be moved in a direction from the operator, the *Gaisfuss* offers the greatest advantages, because it is less liable to slip, and there is therefore less danger of injuring the flaps. After the lateral incision has been made down to the bone, it is only necessary to make strong pressure against the bone with the *Gaisfuss*, and shove gradually along. This does not require that the mouth should be held wide open so that the operator can proceed with but a limited view of the field of operation. This renders the operation much easier in children. The *Gaisfuss* is chiefly useful for the

beginning of the removal of the periosteum, and after this must be replaced by the blunt elevator (see Figs. 15, 16, and 17). In order to fix the borders of the wound while these are being perforated by the needle instrument, Langenbeck no longer uses the hooked forceps, but exclusively a stout strabismus hook (*Schielhäkchen*), which is put into the border of the wound from behind forward. This instrument, which he also uses in staphylorrhaphy, has the great advantage that it never slips, while the frequent tearing out of the hooked forceps bruises the parts."

Although Simon speaks most favourably of Langenbeck's needle, it is, however, apparently not free from objections on account of its delicate mechanism; and Langenbeck remarks that:—

"He would gladly see this needle replaced by a more simple and better instrument, as his has the great disadvantage of easily getting out of order; the hooked-shaped extremity of the spring often bends upon itself, and sometimes breaks off entirely, so that it is necessary always to have several at hand. Again, it has the disadvantage of requiring an expert assistant to place the thread over the hook."

Langenbeck freely concedes that the side incisions are nearly the same as those of Dieffenbach, Baizeau, and Field, for the formation of mucous flaps in the closure of acquired defects of the palate, except that their incisions were less curved. The direction of the incisions is exceedingly important; but the formation of the flaps by Langenbeck from the mucoperiosteal covering of the palate is remarkably original, and has the very great advantage, when properly performed, of not exposing the patient to dangerous and troublesome hemorrhage. The following cases operated by Langenbeck's method, although far from representing the number treated, will, it is hoped, be sufficient to direct the attention of American surgeons to this important procedure. For a more critical examination of the cases cited, the reader is referred to the original articles of the authors mentioned.

A.—Cases of Congenital Deficiency of the Hard Palate.!

CASE 1. "G. S. T., countryman, æt. 22; bilateral cleft of the hard; complete separation of the soft palate and double hare-lip, which had been operated successfully in early life; total cleft two inches three lines long of the hard and soft palate; uranoplasty and staphylorrhaphy at one operation; cure, except a very small opening, which was ascribed to cutting through of sutures; speech improved, though nasal tone remains." (Operator, Beck.)

CASE 2. "F. M., mechanic, æt. 21; cleft of hard palate from junction of the anterior with middle third, and complete cleft of the soft palate; one inch five lines long, eight lines broad; uranoplasty and staphylorrhaphy at one operation; complete cure and dismissal at end of two weeks. Speech, which before the operation was completely indistinct, became pretty good and continued to improve." (Beck.)

CASE 3. "F. P., total left side cleft of hard and soft palate, two inches one line long, and eight lines broad; also hare-lip. The latter had been operated during infancy; left half of intermaxillary bone not well developed, and very oblique, so that its outer edge was almost entirely in left half of the nose; left incisor hardly visible; left ala of nose flattened and buried in the cheek; uranoplasty and staphylorrhaphy at one operation; perfect cure; dismissal in fourteen

days after operation; speech considerably improved; nasal tone remains, which the operator remarks cannot entirely disappear on account of the position of the intermaxillary bone." (Beck.)

CASE 4. "M. B., æt. 19; partial cleft of hard and complete cleft of soft palate; length of cleft one inch two and a half lines; breadth nine lines; uranoplasty and staphylorrhaphy at one operation; complete cure in fourteen days; secondary hemorrhage. The patient was kept very quiet, fed on cold milk; lumps of ice and cold compresses to the part for three days; sutures removed on the fourth day; remarkable improvement in speech, which was exceedingly indistinct before the operation." (Beck.)

CASE 5. "E. B., æt. 18; sister of preceding patient. Partial cleft of the hard and total cleft of the soft palate; length one inch six and a half lines; maximum breadth one inch two lines; excitable nervous temperament, feeble constitution; uranoplasty and staphylorrhaphy on same day as preceding case; operation very difficult; troublesome secondary hemorrhage, and distressing cough; cure incomplete." (Beck.)

CASE 6. "Median cleft of the velum; left-sided cleft of the hard palate (8 millimetres), $\frac{1}{8}$ inch wide posteriorly, and (5 millimetres) $\frac{1}{8}$ inch anteriorly; length of the whole cleft (35 millimetres) 1 inch $\frac{5}{16}$; staphylorrhaphy and uranoplasty 12th September, 1861, using silver sutures; operated three times; cure completed January 18th, 1862." (Operator, Billroth.)

CASE 7. "Æt. 2 $\frac{1}{2}$; left-sided cleft of bony palate nearly half inch long; median cleft of velum; uranoplasty and staphylorrhaphy; silk sutures; slight union at anterior part of cleft." (Billroth.)

CASE 8. "Æt. 8 weeks; no mention of the extent of the deformity; uranoplasty; complete failure." (Billroth.)

CASE 9. "E. S., æt. 13 $\frac{1}{2}$; median cleft of the velum palati; on left side, cleft of the arch of the palate to the incisor teeth; staphylorrhaphy February 6th, 1861; uranoplasty May 11th; complete cure June 24th, 1861; complete formation of bone; considerable improvement in speech." (Operator, Langenbeck.)

CASE 10. "M. M., æt. 24; medium cleft of the velum; on left side, fissure of the palatine vault, extending between the incisors; staphylorrhaphy and uranoplasty at one operation; fissure of the arch of the palate completely healed with solid formation of bone; velum ununited." (Langenbeck.)

CASE 11. "S. S., æt. 16; median cleft of the velum; double fissure of the arch of the palate to the alveolar process; staphylorrhaphy and uranoplasty at one operation, June 12th, 1861; incomplete cure July, 1861; fissure of hard palate almost completely closed; velum ununited." (Langenbeck.)

CASE 12. "C. L., median cleft of the velum and the horizontal portion of the palatine bone; staphylorrhaphy June 29th, 1857; uranoplasty June 10th, 1861; complete cure July 2d, 1861; deficiency of the palate completely closed without osseous formation; in the velum two small openings remain; speech defective, although improved." (Langenbeck.)

CASE 13. "D. L., æt. 22; deficiency of the left intermaxillary bone; operation July 6th, 1861; complete cure August, 1861; good formation of bone; there remains, however, a small slit in the alveolar process (einkniff)." (Langenbeck.)

CASE 14. "J. L., æt. 23; median cleft of the velum; fissure on the left side of the arch of the palate extending to the incisors; uranoplasty August 8th, 1861; staphylorrhaphy May 7th, 1862; cure incomplete; velum palati very finely healed; bone fissure lessened by half." (Langenbeck.)

CASE 15. "A. K., æt. 22; median cleft of the velum; fissure on the right side of the hard palate extending to the alveolar process, one inch; staphylorrhaphy October 26th, 1861; uranoplasty December 7th, 1861; complete cure January, 1862; very fine form of the vault of the palate with solid formation of bone; speech had become perfectly distinct in the summer of 1862 (see *Deutsche klin.*, 1865, No. 1)." (Langenbeck.)

CASE 16. "M. G., æt. 26, total absence of the bony, and partial absence of the involucrem of the palate; median cleft of the velum, nine lines; staphylorrhaphy 1859; uranoplasty February 7th, 1862; complete union, no bony forma-

tion; two very small fistulæ caused by the sutures; slight improvement in speech." (Langenbeck.)

CASE 17. "A. H., æt. 23; median cleft of the velum; cleft on left side of the vault of the palate to the incisors, ten lines; staphylorraphy May 17th, 1862; uranoplasty June 4th, 1862; complete cure August, 1862; very fine form of the vault of the palate; perfectly distinct speech observed November, 1862." (Langenbeck.)

CASE 18. "F. S., æt. 15; median cleft of the velum; cleft on left side of the vault; deficiency of the alveolar process after resection of intermaxillary bones, seven lines; staphylorraphy April 30th, 1862; uranoplasty June 5th, 1862; complete cure July 26th, 1862; complete formation of bone; considerable flattening of the vault; very distinct speech." (Langenbeck.)

CASE 19. "J. R., æt. 9; median cleft of the velum; hard palate cleft to beyond the horizontal portion of the palatine bone in the median line; palatine bone cleft further than the involucre. Staphylorraphy and uranoplasty at one operation, June 25, 1862. Complete cure July 16, 1862. Very fine form of the vault; no new osseous formation." (Langenbeck.)

CASE 20. "F. S., æt. 12½; median cleft of the velum; double cleft of the vault; deficiency of the alveolar process after resecting of the intermaxillary bones seven lines. Staphylorraphy April 26, 1862; uranoplasty July 5, 1862. Complete cure July 26, 1862; no formation of bone; slight improvement in speech." (Langenbeck.)

CASE 21. "L. B., æt. 20; median cleft of the velum; of the horizontal part of the palate bone, and of the posterior third of the palatine process three-fourths of an inch. Staphylorraphy 1859; uranoplasty June 21, 1862. Complete cure July 28, 1862. Speech, which before the operation was entirely unintelligible, has become intelligible." (Langenbeck.)

CASE 22. "W. S., æt. 9; median cleft of the velum; of the horizontal portion of the palate bone, and of the posterior half of the palatine process of the maxillæ. Staphylorraphy May 24, 1862; uranoplasty June 28; and a second uranoplastic operation July 29. Cure complete August, 1862. Very beautiful formation of the velum and of the vault of the palate." (Langenbeck.)

CASE 23. "A. G., æt. 15; median cleft of the velum, of the horizontal portion of the palatine bone, and of the posterior half of the palatine process of the maxillæ, nine lines broad, one and a half inch long. Staphylorraphy July 19, 1862; uranoplasty Aug. 6, 1862. Complete cure Aug. 14, 1862; no osseous formation; opening, size of pin-head, remaining in the velum." (Langenbeck.)

CASE 24. "G. W., æt. 18; median cleft of the velum; cleft on right side of the vault to the alveolar process nine lines broad. Staphylorraphy July 19, 1862; uranoplasty Aug. 6, 1862. Complete cure Aug. 20, 1862." (Langenbeck.)

CASE 25. "M. P. F., æt. 9½; median cleft of the velum; double-sided cleft of the vault of the palate and of the upper lip; ossa intermaxillary removed; cleft nine to eleven lines broad. Staphylorraphy June 20, and again on August 9; (hare-lip operated 17th of preceding month); uranoplasty October 19, 1862; November 10, 1862, failure; upper lip very beautifully healed; breadth of bony cleft reduced throughout its whole length to three lines; cleft of the velum unchanged." (Langenbeck.)

CASE 26. "A. P., æt. 18½; median cleft of the palate; of horizontal portion of palatine bones; of posterior third of palate process of the maxillæ, six lines long and four lines broad. Staphylorraphy and uranoplasty at one operation, July 19, 1862. Cleft in the hard palate completely closed; velum separated again." (Langenbeck.)

CASE 27. "C. H., æt. 7; median cleft of the velum; cleft on left side of the vault to the alveolar process six lines broad. Uranoplasty August 16, 1862; Staphylorraphy October 29, 1862. Cure complete 20th November, 1862; good formation of bone in the new palate. In May, 1863, there was observed a solid formation of bone throughout the whole extent of the palatine arch. Considerable improvement in speech." (Langenbeck.)

CASE 28. "H. B., æt. 29½; median cleft of the velum; double cleft of the vault to the alveolar process, eleven lines broad; uranoplasty November 19;

Staphylorrhaphy December 15, 1862. Cure complete February 6, 1863. The left lateral incisure was entirely closed, however. Speech perfectly intelligible." (Langenbeck.)

CASE 29. "L., æt. 15; median cleft of the velum; complete double cleft of the vault and of the alveolar process; absence of intermaxillary bones, nine lines broad. Uranoplasty January 23d; staphylorrhaphy February 18, 1863. Cure complete April 1, 1863; complete new osseous formation; speech perfectly intelligible." (Langenbeck.)

CASE 30. "Æt. 3; palatine fissure in front $\frac{3}{4}$ ths of an inch wide (0.010m.), and about $\frac{1}{4}$ ths (0.017m.) opposite the insertion of the velum palati. The right side of the osseous cleft was $\frac{3}{4}$ ths of an inch, and the left side $\frac{1}{4}$ ths of an inch deep. Uranoplasty May 23, 1863; staphylorrhaphy May 30. Cure complete, except a narrow opening about $\frac{3}{4}$ ths of an inch long behind the os incisivum. On 26th August, three months later, was unable to detect, with the point of a bistoury, any new osseous formation." (Operator, Sédillot.)

CASE 31. "Æt. 10; cleft of the soft palate; cleft of hard palate to the alveolar process. Uranoplasty and staphylorrhaphy; operation upon small opening which remained, uniting the arcus pharyngo-palatini. Complete closure of the cleft of the hard palate; arcus pharyngo-palatini united within ($1\frac{1}{4}$ centimetres), nearly half an inch under the uvula. Speech nasal, but intelligible." (Operator, Simon.)

CASE 32. "Æt. 10; cleft through hard and soft palates, and alveolar process; os incisivum wanting. Uranoplasty and staphylorrhaphy; repetition of latter after division of anterior curtain. Complete cure. Speech nasal, and hard to understand." (Simon.)

CASE 33. "Æt. 19; cleft through soft palate, and left side of hard palate and alveolar process. Uranoplasty and staphylorrhaphy; complete cure after spontaneous closure of a small opening. Speech nasal, and hard to understand." (Simon.)

CASE 34. "Æt. 16; cleft through hard and soft palate to alveolar process. Uranoplasty and staphylorrhaphy; complete cure after spontaneous closure of a small opening. Speech nasal, but intelligible." (Simon.)

CASE 35. "Æt. 10; cleft through soft and hard palate; alveolar process closed. Uranoplasty and staphylorrhaphy; complete cure after spontaneous closure of a small opening. Speech nasal, but more intelligible." (Simon.)

CASE 36. "Æt. 17; cleft through hard and soft palate; absence of the os incisivum. Uranoplasty and staphylorrhaphy; closure of a small opening afterwards; complete cure after the operation. Speech nasal, and hard to understand." (Simon.)

CASE 37. "Æt. 23; cleft through hard and soft palate. Uranoplasty and staphylorrhaphy; complete cure after spontaneous closure of a small opening. Speech less nasal; more intelligible." (Simon.)

CASE 38. "Æt. 25; cleft through hard and soft palate; alveolar process closed. Uranoplasty and staphylorrhaphy; soft palate closed, hard palate reopened; speech as before." (Simon.)

CASE 39. "Æt. 2; cleft through hard and soft palate; alveolar process closed. Uranoplasty; death on the tenth day from septæmia." (Simon.)

CASE 40. "Æt. 22; very wide cleft of hard and soft palate; alveolar process closed. Uranoplasty and staphylorrhaphy; cure after closure of a small opening; speech nasal, and hard to understand." (Simon.)

CASE 41. "Æt. 6; a very wide cleft through lips, alveolar process, hard and soft palate. Uranoplasty and staphylorrhaphy. Cure after closing the reopened soft palate. Speech nasal, but more intelligible." (Simon.)

CASE 42. "Æt. 12; very wide cleft through hard and soft palate. Uranoplasty and staphylorrhaphy. Complete cure after spontaneous closure of a small opening. Speech nasal, but more intelligible." (Simon.)

CASE 43. "Æt. 4; very wide cleft through hard and soft palate. Uranoplasty. Complete closure of hard palate. Speech nasal as before; was to return for staphylorrhaphy." (Simon.)

CASE 44. "Æt. 15 days; cleft through hard and soft palate; alveolar process

closed. Uranoplasty and staphylorrhaphy; closure of hard palate; reopening of anterior curtain. Death 26th day after operation." (Simon.)

CASE 45. "Æt. 7 months; cleft through hard and soft palate and alveolar process. Uranoplasty. Cure; was to come again for staphylorrhaphy." (Simon.)

CASE 46. "Infant few weeks old; double hare-lip; cleft of the hard and soft palate; narrow in front and gradually widening to six lines; on the left side the palatine process was oblique and united with the vomer; palatine process on right side vertical and very narrow. Uranoplasty and staphylorrhaphy; sutures successively removed from the 4th to the 7th day; union of the parts, but all except the anterior portion of the cleft soon separated and the operation failed. The parts suppurated and subsequently death occurred from exposure, inducing thoracic disease." (Operator, C. Otto Weber.)

CASE 47. "Miss A., æt. 25; absence of the palatine vault; with very rudimentary development of the palatine muscles. The broad chasm, through which were plainly visible the vomer and inferior turbinated bones, was limited in front by the gums of the incisors and a slight projecting ledge of bone, and laterally by the alveolar processes of the superior maxillæ. There was no ledge of bone on the sides of the chasm to represent the horizontal processes of the maxillæ or palate bones. The breadth of the long chasm was seven-eighths of an inch; the open space between the atrophied palatine muscles was more than an inch. She wore a light metallic obturator that slightly improved the speech, which notwithstanding this device was unintelligible to strangers. Staphylorrhaphy, 1st July, 1867, simply with a view to unite the uvula and add to the usefulness of the obturator; very partial union of the parts obtained. Two other attempts at staphylorrhaphy with most beautiful results, forming a thick, firm, and resisting bridge of the soft parts. One attempt at mucous uranoplasty; gangrene of the parts and failure. November 16th, attempt at periosteal uranoplasty by the method of "renversement:" dangerous hemorrhage and gangrene of the parts, which was stopped with creasote water. The only effect of this last operation was the narrowing of the cleft of the hard palate. March 12th, 1868, *periosteal uranoplasty by Langenbeck's method*; operation was executed with great facility except the passage of the sutures, for want of the proper kind of needles. July, 1868, complete closure of the chasm except a small opening, which appears to be closing spontaneously. Speech distinct and intelligible, but nasal." (Operator, Whitehead; see *Amer. Journ. Med. Sciences*, July, 1868.)

B. Acquired Defects of the Hard Palate.

CASE 1. "Æt. 39; circular aperture (nineteen millimetres) eleven-sixteenths of an inch in diameter just behind the alveolar process, result of syphilis; there were no teeth in the upper jaw; it was apprehended that sufficient tissue could not be obtained to close the opening. Uranoplasty; union perfect. Restoration of perfectly normal speech on 14th day." (Billroth.)

CASE 2. "H. W., æt. 14; deficiency in the bony palate, result of caries scrofulosa, nine lines long, six lines broad. Uranoplasty April 23d, 1862, and again June 5th, same year. Complete cure July 11th, 1862. Perfectly normal speech." (Langenbeck.)

CASE 3. "H. L., æt. 17; deficiency in the bony palate six lines long and five broad; absence of nose; caries and lupus scrofulosa. Uranoplasty May 17th, 1862. Complete cure July 1st, 1862. Perfectly normal speech." (Langenbeck.)

CASE 4. "M. H., æt. 56; deficiency of the whole right half of the bony palate, and of the upper jaw after resection; two inches long and thirteen lines broad. Uranoplasty 24th of June and again on the 5th July, 1862. Cure incomplete August 16th, 1862. Remarkably distinct speech." (Langenbeck.)

CASE 5. "Æt. 33; deficiency of the hard palate six lines in diameter. Uranoplasty August 12th, 1862. Cure complete November 20th, 1862; no new osseous formation; two suppurating suture holes remained." (Langenbeck.)

CASE 6. "Æt. 28; cleft (two centimetres) three-quarters inch long (twenty-five millimetres), about one-eighth inch wide in the raphé of the hard palate, near the alveolar process; uvula wanting; contraction of soft palate by cicatrix,

consequence of syphilis. The flaps were very small; the right flap torn at its anterior extremity. Complete cure by cicatrization after sloughing of one of the flaps. Speech nasal, but by practice more intelligible." (Operator, Simon.)

CASE 7. "Æt. 44; round opening three-quarters of an inch in diameter on the right half of hard palate; deficiency of the inner plate of the alveolar process and loss of two back teeth from gunshot wound. United the detached soft parts of the right half of the hard palate with the external covering of the alveolar process. Complete cure. Perfect restoration of speech immediately after closure of the defect." (Simon.)

CASE 8. "Æt. 42; round opening in hard palate at the median line. *Necrosis of palatine bones and vomer.* Formation of a flap. *Removal of necrosed bones.* Cured with exception of a small opening near the alveolar process. Natural speech by wearing an obturator." (Simon.)

Accidents which may occur during and after the Operation.—Hemorrhage, which may occur either during or after the operation, is sometimes considerable; Simon had primary hemorrhage originating from the lateral incision in two cases, in which the bleeding was controlled by injections of cold water and by pressure. In these same cases, and also in a third, secondary hemorrhage took place; appearing in two cases on the third day, and in one on the fifth, and persisting until the tenth day. These hemorrhages came also from the lateral incisions. Tamponing with lint and sponge proved unavailing. Simon was finally compelled to dip the lint in a solution of perchloride of iron, although he feared that this might act injuriously upon the line of union. These fears proved to be unfounded, the hemorrhage was arrested and union was not interfered with. Beck remarks that the bleeding usually occasions very little trouble, and that in one case where the superior palatine artery being anomalous, was cut; the hemorrhage was controlled by pressure and the application of cold water. In this case the nutrition of the flaps was not interfered with. If the palatine artery be cut, hemorrhage more or less troublesome should be expected. And, in order to provide myself against the recurrence of such trouble, I had at hand a spray instrument for projecting ice-water spray, and if necessary a cold styptic solution on the bleeding part. Hemorrhage is much more apt to occur in mucous uranoplasty than when the periosteum is separated from the bone; the little vessels are torn away and not cut, and in the detachment of this membrane a portion of the palatine artery is elevated with it. According to Langenbeck, "in fourteen cases where mucous uranoplasty alone was done, there were six cases of dangerous secondary hemorrhage, while in twenty-five of his cases where the periosteum was detached, there was no after-bleeding."

Sloughing of the flaps Simon noticed in two cases:—

"In the first of these the anterior attachment of the right flap to the alveolar process was torn off. In the second case the flap, which afterwards sloughed, was by a sudden movement of the patient's head nearly cut through, leaving only about the breadth of a line to preserve the connection. In the first case the opening made by the slough closed spontaneously. In the second case no cicatrization took place on account of the child's death. In all the other patients operated on by him, even in very young children, the operation was well

borne. Marked phlegmonous inflammation with pyæmic and septæmic symptoms occurred in both of the cases, attended with sloughing of the flaps. In both cases only the operation of uranoplasty was performed, but nevertheless the soft parts of both the hard and soft palate became swollen and œdematous even to the very tip of the uvula. The wound discharged thin offensive pus, and the swollen soft parts of the mouth were covered with a thick tallowy coating. In the first of these cases, there were repeated secondary hemorrhages; three marked chills, followed by significant elevation of the temperature and pulse, but the patient finally recovered. In the second case the child died on the tenth day after the operation from septæmia. (See case 39.)

"Simon remarks that other operators have observed these same phlegmonous inflammations, but the result was always fortunate, so far as life was concerned, though the operation was unsuccessful.

"So far as Simon is aware, the foregoing case is the only one where the operation of uranoplasty has been attended with a fatal result, and in consideration of the large number of cases in which it has been performed, the operation he states must be regarded as one attended with very little danger."

Gangrene of the flaps may occur after division of the palatine artery. I have observed this complication, and have promptly checked the disease by frequent detersive injections of creasote water. Weak creasote water spray is a most soothing and excellent application to the parts after uranoplasty, and, when thrown into the nares through the nostrils, contributes much to the comfort of the patient. Care should be taken not to project the jet of spray, when throwing it in the mouth, upon the line of the united flaps, but in the side cuts and in the throat.

The after-treatment is very important: no talking should be permitted, and deglutition avoided as much as possible. Beck permits his patients to have only a little cold milk, and by spoonfuls at a time; on the fifth day he gives beef-tea, and not until the seventh soft eggs. He permits no solid food until the cure is effected. He remarks that "he thus avoids inflammatory reaction, needs no prolonged cold applications, or astringent gargles. When uranoplasty and staphylorraphy can be done at one operation, the cure is more complete, and the means required to combat inflammatory reaction no greater than when uranoplasty alone is performed." Leeches applied to the outside of the throat produce good results in abating inflammation. The patient may be fed on beef-tea on the second day, but no solid food should be permitted until the twelfth or fourteenth day. Beef-tea may be given in injection. Cotton slightly saturated with glycerine should be put in the side cuts to prevent strain on the sutures by the too rapid healing of the cuts; at the same time by this means, as Simon has very properly observed, the line of union is lengthened. The sutures, if of silver, should not be removed before the twelfth or fourteenth day, as they cause no irritation and give support to the newly-formed tissue. The middle sutures should be the last ones removed.

Modifications of Langenbeck's Method.—An important modification of this method by Simon is the freshening of the edges of the cleft after, instead of before separating the soft parts. A greater accuracy of approxi-

mation is thus secured. He makes the lateral incisions after the passage of the sutures.

The union of the parts which still gape is promoted by making incisions for extension just long enough to secure the coaptation of the borders. Langenbeck regards interrupted side incisions sufficient in most cases to readily secure approximation of the pared edges. In two cases Simon considerably modified Langenbeck's operation :—

“In one there was a deficiency on the right side of the palatine vault and also a loss of the alveolar process of the same side, caused by gunshot wound. The deficiency measured one and a half centimetres in diameter, and was about one centimetre from the raphé. The speech was strongly nasal. To close this opening Simon united the external covering of the alveolar process of the right side with the soft parts of the right side of the palate, because on the right border of the defect there remained only the soft parts of the external portion of the alveolar process. He removed with bone forceps the remaining portions of the alveolar process projecting into the opening. Then the soft parts of the palatine vault were detached towards the left and made movable by a free incision at the side. These parts were now drawn over and united with the external covering of the alveolar process, which had been separated by incision from the mucous membrane of the cheek. Langenbeck, and Wagner, of Königsberg, have used the gums in uranoplasty successfully.”

In the second case Simon performed a very remarkable operation, which—

“Not only closed a defect of the palate, but also aided in the removal of necrosed portions of bone consisting of the palatine process of the upper jaw and the vomer. By forming a long tongue-shape flap, which remained only in connection with the anterior pillar of the soft palate, sufficient room was obtained to reach the dead bones and remove them.”

Simon has attempted but one case of what he calls osseous uranoplasty : “In the hope of obtaining more intelligible and less nasal speech. The patient was a child twenty weeks old, having a small cleft in the posterior part of the hard palate and cleft of the soft palate. The operation was a failure.”

Dr. Elsberg kindly called my attention to an operation performed by Prof. Thiersch, of Leipsic, recently published. (*Arch. für Heilkunde*, 2d Heft, 1868, p. 159.)

The defect of the palate which necessitated an operation in this case was the result of a pistol shot, and was two and a half centimetres long, and two centimetres broad. Uranoplasty had been done, and the bones so much denuded as to cause necrosis—which, however, is an exceedingly rare occurrence. Afterward, an obturator affording no relief, the patient, being very much incommoded by the infirmity, applied to Thiersch, who used successfully a flap, taken from the entire thickness of the cheek, to close the opening. This flap remained adherent to the cheek superiorly, and its free portion was transplanted and secured by suture to the pared edges of the opening in the palate, and afterward the outside wound of the cheek was approximated by suture. The operation succeeded.

In the cutting of the palatine muscles, Beck, as already recommended by

Pollock in his operation, first passes a silk suture through the soft palate, and then cuts with the sickle-shape tenotome knife of Langenbeck.

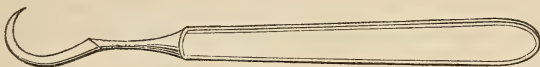
The sharp-pointed, double-edge knife, curved on the flat, represented at Fig. 6, appears to me to be a dangerous instrument; apprehending which, I had a similar instrument made, but terminating with a very delicate probe point. For the side cuts a knife, with a convex cutting edge and thick

Fig. 9.



back, represented at Fig. 9, was very handily used; and for the thorough division of the palato-glossus, and especially the palato-pharyngeus, such a sickle-shaped knife as is represented at Fig. 10.

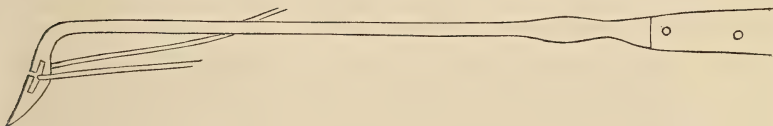
Fig. 10.



This last instrument, I believe, will be found very useful in dividing completely the pillars of the fauces in staphylorraphy.

Beck attributes great importance to his needle instrument, seen at Fig. 11.

Fig. 11.



The one which I have had made is shaped like Stone's aneurism needle (see Fig. 12), and is a simple, inexpensive, and effective instrument, which I propose to use in future. These instruments are represented half

Fig. 12.



size. Mr. T. Smith, in a paper on the cure of cleft palate in children, read before the Royal Medical and Chirurgical Society, on the 14th of June, 1867, mentions a very successful plan of operating for fissure of the soft palate, by the aid of a properly devised gag and chloroform, and alludes favourably to the use of gut sutures. Mr. Smith's operations were confined to staphylorraphy, though in nine of his eleven cases the deformity involved the bony palate, no operation being attempted on the hard

palate. (See *American Journ. of the Med. Sciences*, April, 1868.) The reproduction of bone after Langenbeck's operation has been observed in only a certain proportion of the cases; but the fact is sufficiently well established to make it an important feature of this new method.

As this subject is new, and the experience of it limited to a small number of surgeons, I shall continue to quote from Simon's paper, as I have already from the publications of Langenbeck. As I am desirous that ample justice shall be accorded to the views of the distinguished surgeon of Rostock, now of Heidelberg, and especially to those concerning the influence of uranoplasty and staphylorrhaphy on the speech, it is proper that I should defer comment upon this subject until his opinions have been fairly exposed, and then frankly and unreservedly, by the light before me, judge them with impartiality.

Influence of Staphylorrhaphy and Uranoplasty upon the Speech.—This very important point has received attention from Simon, and he attaches very great importance to the obtaining of an absolute purity of speech; that is, without the least admixture of nasal tone. He remarks:—

“Unfortunately, the results thus far have not realized our expectations. In many instances, indeed, the speech has been materially improved; but only in a few cases of acquired defects, where the curtains of the palate remained intact, has the speech been *completely restored*.”

The immediate cause of the nasal tone when it persists after a successful operation, he very properly attributes to the abnormal communication still remaining between the nose and the pharynx and the penetration and resonance of the vocal tones in the nasal cavity.

“This abnormal communication,” he observes, “can depend upon a variety of causes. Langenbeck (*Arch. für Klin. Chir.*, Bd. 5) believes the cause to be due to faulty innervation, or paralysis of the muscles of the velum, like that seen in diphtheria, and also ascribes as another cause the bad habit of pronunciation.” Simon, however, has recently had an opportunity to put this theory to a fair test: “Having a case of paralysis of the throat from diphtheria in a young man twenty years of age, he placed this case in direct comparison with one of united cleft palate in a young woman twenty-one years of age. In both cases the admixture of the nasal tones was present in a very high degree, but Simon convinced himself that the imperfect closure of the communication between the nose and the pharynx arose from totally different causes. In the case of diphtheria the paralyzed curtain of the palate had lost almost entirely its arched form, and hung down nearly at a right angle upon the back of the tongue, so that the velum was distant from the posterior wall of the pharynx more than the third of an inch, leaving a correspondingly abnormal communication between the pharynx and the nasal cavity. In pronouncing ‘A’ and ‘Ach’ the muscles did not move, the curtain and arcus remained in their abnormal position, the opening was not shut, and the nasal tone remained. In the case of united cleft, on the contrary, the muscles moved most vigorously (in pronouncing the same sounds), the curtain attempted to arch upward, and the arches to approach each other, but the palate was too short, the tension of the arcus too great to permit the opening to be closed. The diphtheritic paralysis disappeared in the course of two months, and the speech became again pure. In the case of the cleft, now for two years united, the speech has not improved. The explanation of bad habit seems to Simon unsound. He remarks that

Langenbeck cites as proof of the influence of bad habit, a case of twins, sixteen years old, where the patients, after cure of congenital cleft palate, spoke imperfectly for a long time, but in the course of a year their speech became pure. That in this case, observes Simon, muscular paralysis was the cause of the remaining nasal speech can hardly be doubted, but from the very fact that the speech in the course of a few months became pure shows that there are other causes which interfere with the recovery of the speech, for although the operation has been very generally adopted for the last five years, and attended with the most complete success, there is not yet a single well-authenticated case where the speech has been *made pure*, by the gradual cure of the paralyzed muscles, or through exercise. Even in the cases of spontaneous cure which Simon and other authors have observed, the speech had still the nasal tone. Here, remarks Simon, certainly there could be no muscular paralysis. For these reasons he cannot adopt Langenbeck's view. He states that according to another view put forth by Passavant, of Frankfort (*Arch. der Heilkunde*, von Rosen und Wunderlich, iii., 10 und 16, und *Arch. für Klin. Chirurg.*, vi., bd. ii.), the abnormal communication and admixture of the nasal tones depend upon shortening of the palate caused by a want of development of the lateral halves, so that the palate loses in length what it gains in width. This view, with certain modifications, Simon adopts as the correct one. Shortening of the palate, he states, must remain after every operation for cleft of the hard palate, and also after every staphylorrhaphy, and to this must the abnormal communication and nasal tone be ascribed, but the palate is not absolutely but only relatively too short, and he does not believe, with Passavant, that the shortening depends entirely upon a want of development of the lateral halves, but more especially upon contraction of the extensive cicatrix, which binds the two lateral halves together. Simon asserts that a contraction of the cicatrix must obtain in all cases and must be proportionately very considerable: He remarks that the degree of contraction produced in long cicatrices can easily be observed in cases of hare-lip operated upon by the old method; the resulting shortening in these cases often amounting to one-third of the whole height of the lip. This same contraction is also exerted after uniting a cleft palate, and indeed to such an extent that he has observed small transverse openings become completely closed after the operation of uranoplasty. This contraction also obtains in cases of spontaneous closure, Langenbeck himself having noticed this (see work already quoted, p. 73). The contraction of the cicatrix, and consequent shortening of the palate, depend upon the length of the cicatrix and the mobility of the parts. In wide clefts, where all the soft parts are separated from the bones, and the parts united in their whole length, the contraction will, of course, be greater than in small clefts at the posterior part of the hard palate. For the same reason the shortening of the curtain of the palate will be far greater where the bones are not united at the spina nasi, and the soft parts only are closed, than where the bones are united. In the first instance the cicatrix continues to contract on the fissure between the bones, while in the second, the contraction of the cicatrix meets with resistance at the point where the bones are united. The shortening, according to Simon's observations, is never in any case so extensive as to make the palate absolutely too deficient for closure of the communication between the nasal cavity and pharynx, but yet even in the most favourable cases, for example, those in which spontaneous closure ensues, the abnormal communication still remains, and nasal speech is the consequence. This happens not because the curtain of the palate is absolutely too short, but because the contraction unfortunately is exerted in a most unfavourable position, viz., at the back of the velum, which serves for the closure of the nasal cavity. Not only this: the free border of the velum and the uvula, which also aid in closing the nasal orifice, are prevented from being raised high enough to perform their office in spite of the most active muscular efforts. The back of the velum instead of rising to meet the constrictor pharyngis superior, is thrown forward and the arcus rendered more tense than in the normal condition of the parts. Simon believes this to be the true explanation of the cause of nasal speech even after the most favourable operations. According to him, the fact that in every case the nasal speech can

be made almost pure by forcible elevation of the velum with a spatula, so that its free border may come in contact with the constrictor, pharyngis superior, needs no explanation. This experiment, he states, thus far proved successful in every case in his hands, even in those where the shortening was very great. Simon's observations lead him to this conclusion: that in all cases of cleft palate in which the hard palate is not united at the spina nasi the contraction of the cicatrix will be so great that the nasal tone will predominate. In the two cases of cleft of the soft palate cited in the table of his paper, the nasal tone persisted after successful staphylorraphy. In both of these, however, a small opening in the bones could be felt through the soft parts. Again, in all those cases of spontaneous closure where the bones were not united at the spina nasi, the same nasal tone has remained. Therefore, it would seem to follow, according to his view, that uranoplasty will never enable us to restore the *purity of speech*, and that even in simple cleft of the soft palate we may look for a favourable result with regard to purity of speech only in those cases where the hard palate is united at the spina nasi, in which latter the contraction of the cicatrix is confined to the soft palate. From the foregoing, he says, it appears evident that we must not only strive to close the soft parts of the palatine arch, but also the bony portions at the spina nasi, or, as Passavant has indicated, to lengthen the palate in such a manner as to enable it to come in contact with the posterior pharyngeal wall. Simon next alludes to means and plans proposed to remedy the defect in speech; he regards regular daily exercise of the organs of speech as useful in training the lips and the tongue to more distinct articulation, but so far as the nasal tone is concerned, *vocal exercise* does no good, even when faithfully persevered in for years. With regard to exactitude in the performance of the operation, or modifications of the same, he does not think that much can be hoped for, so far as prevention of the nasal tone is concerned. He observes that Langenbeck has laid great stress upon performing the operation with interrupted side incisions, and also upon closing the cleft, if possible, by one operation, and never exceeding two. Simon has followed these suggestions but without success in bettering the speech, nevertheless the method of performing the operation will have some effect upon the degree of nasal admixture in the speech, and is therefore of importance. In those cases in which the lateral halves are pretty well developed, a successful and proper performance of the operation will make the speech much less nasal and far more intelligible. Simon says that it has also been thought that by operating upon very young children the nasal tone would be gradually done away with. With this view Billroth, C. O. Weber, and himself have undertaken the operation. But these hopes, after the observations which have been made in spontaneous closure, must be given up. In one of these cases of spontaneous closure, the child has now reached the age of seven years, and the nasal speech still remains. Simon states that Passavant has devised several operations by which, after staphylorraphy and uranoplasty, a diminution of the communicating opening between the nasal cavity and pharynx may be effected. These operations are: 1st. The bringing together of the palato-pharyngeal arch. Simon has tried this, and is convinced that it will bring no material aid. The united arch will not permit the back of the posterior curtain to be raised high enough to cause closure and the speech still remains nasal. 2d. Bringing the uvula in contact with the posterior wall of the pharynx as high up as the constrictor pharyngis superior. The pharynx is freshened, and also the posterior part of the uvula and the posterior curtain. The latter part of the operation is rendered less difficult by separating the curtain by transverse incisions and drawing it forward. In this way the posterior part can be brought to view, and by proper instruments freshened. By means of sutures, which fasten the curtain to the pharynx, the parts are so united that only a small opening remains at the side of the uvula; this opening, by the action of the superior constrictor of the pharynx and the muscles of the adherent velum, can be momentarily closed. Passavant has performed this operation upon a girl fourteen years old and the result was speech in which, although the nasal tone had not entirely disappeared, approached very nearly perfection. Simon finally proposes an operation of osseous uranoplasty, wherein he attempts

to combine the advantages of the old method of Dieffenbach with those of the new method of Langenbeck. Thus far he has tried this operation in but one case, and this one was a failure. He thinks that a more extended trial should be made of his method, especially upon adults, before its merits or demerits can be fairly determined."

To accept the expressions of Simon regarding the results of this operation on the speech as a final decision of the question, without a fair appreciation of the advantages which are distinctly stated by other operators, would be as incorrect as to attribute to uranoplasty an invariably excellent result. From a careful examination of the facts before us, we can readily perceive that in nearly every case properly operated by this method there was a considerable improvement in speech and of the condition of the patient. Simon attaches great importance to purity of speech, and by this he means, speech without the slightest admixture of nasal tone. In this respect it is to be doubted that very many of the cases are entirely relieved of this defect. As Langenbeck and others have shown, *distinctness of speech* may be obtained in nearly all cases. If there remain a nasal tone, however, and it be very considerable, especially in the Anglo-Saxon languages, necessarily the result of the operation is marred. Nasal tone, when not very great, is perfectly consistent with intelligible speech, as is attested by many who are not affected with cleft palate, and whose speech though nasal is quite distinct. Indeed, a more or less nasal accent in the pronunciation of certain words of our own, and several other languages, constitutes purity of speech. In the German language such is not the case. A much regretted French surgeon, Malgaigne, whose very marked nasal accent gave a peculiarity to his talented discourses, which were at times distinguished by sharp sarcasm, offered an eminent example of an exaggerated, but distinct nasal tone. A distinct speech, even though nasal, may be regarded as exceedingly desirable for those who, being affected with cleft palate, cannot, except with great difficulty, be understood, especially since, by surgical aid and subsequent vocal exercise, they may obtain a distinct and perfectly intelligible articulation. In an impartial examination of this subject, the question which interests the surgeon and especially the patient, is to know all the advantages to be obtained by this operation, and such advantages are not fairly stated when a defect, which is often comparatively inconsiderable, is made the basis of a criticism adverse to the general results of the operation. Besides, I must admit that I cannot conceive how Simon expects, by his operation of osseous uranoplasty, to obtain results which will improve the speech beyond what is already claimed for Langenbeck's procedure. I recognize with pleasure the ingenuity and bold originality of Simon's operation, and think that, had it only been successful, it would have deservedly won from the Berlin surgeon some of his laurels in this department of plastic surgery. I do not think that Simon has fairly accredited Langenbeck's statements with regard to the results of his operation on the

speech, and especially his case of twins, in which he distinctly declares that the speech became perfectly natural.

Langenbeck remarks that if, after closure of a cleft palate, the remaining difficulty of speech depends upon muscular insufficiency of the tongue, and especially of the soft palate, then the question arises whether or not, with lapse of time, a completely normal speech may not be expected; *he replies, I can answer this question in the affirmative most positively.* (*Arch. für Kl. Chir.*, page 74, V. Bd.)

Beck observes that deglutition was made good, and remarkable improvement of speech obtained in all of his cases. Beck also adds that some surgeons object to the operation on the ground that speech never loses its nasal tone; but that facts are different; that vocal gymnastics, as reading aloud, etc., make the speech from day to day clearer. He observes that a very important advantage gained by the operation, is that the flowing down of the nasal secretions is prevented.

When the cure can be obtained by a single operation, or at most two operations, the result is necessarily much better, as too great an inodular contraction subsequently is avoided.

Of course the degree of improvement in speech will always, more or less, be subordinated to the previous extent of the deformity and other circumstances, especially the particular mental aptitude of the patient. Here I should remark that the force and distinctness of speech are very much increased in those persons who speak more from the front of the mouth than from the throat, and this is especially aided by a large, deeply-arched palatine vault. Such persons sometimes have the peculiar faculty of producing without effort a remarkably loud and distinct articulation, which far exceeds the ordinary volume and force of the human voice. The palatine vault, as the sound-board of the voice, if very flat, is less favourable to a concentration and projection outward of vocal sounds, and when this is the case, the distinctness of those sounds must necessarily depend somewhat upon this peculiar form of the hard palate.

Consequently the difference in the result obtained on different patients, who have been operated for cleft of the soft palate, may be very considerably influenced by this form of the vault, and it is always desirable in operating for cleft of the hard palate to give, if possible, a good shape to the roof of the mouth.

The views of Simon regarding the production of nasal tone have been anticipated by a distinguished and remarkably skilful dentist¹ of this city, who has devised an obturator, which I believe to be far superior to any other mechanism of this kind. In connection with congenital cleft palate,

¹ Congenital Cleft Palate: Paper read before the New York Academy of Medicine. By Norman W. Kingsley, Professor of Dental Mechanism in the N. Y. College of Dentistry. Reprinted from the Bulletin of the Academy, Jan. 1866. pp. 15.

this gentleman remarks that the velum exercises a more important office in the modulation of sound than any other organ except the tongue. He observes that to produce certain sounds the passage from the pharynx to the posterior nares should at times be entirely closed, while for other sounds, it should be entirely open, permitting the whole voice to pass in that direction. He also makes the practical observation, that the large size of the nostril gives a peculiarly unpleasant tone to the voice of patients having cleft palate complicated with hare-lip, and that during the operation for this defect of the lip the size of the nostril should be lessened. Certainly very few surgeons and a still smaller number of dentists have heretofore possessed such clear and practical views regarding the influence of the velum palati upon the speech.

Mechanical Treatment of Cleft Palate. Obturators.—As these devices are designed to effect the same purpose as the operation of muco-periosteal uranoplasty, it is but proper to allude to them. They have their incontestable advantages and their defects, and are at best but mechanisms and makeshifts, which uranoplasty may most frequently replace, but which perhaps are occasionally to be preferred to this operation.

Baizeau, in allusion particularly to acquired defects of the palate, remarks that the obturator is only a palliative means, and should be removed each day to avoid irritation, and that this mechanism is a cause of inconvenience and opposes the radical cure of the perforation. So that notwithstanding the utility of the obturator, is it preferable where it is possible to obliterate the opening by a surgical operation? Baizeau further observes that the obturator may be swallowed and produce serious trouble. Hévin relates, in his memoir upon foreign bodies in the œsophagus (*Mémoires de l'Acad. Roy. de Chirurg.*), a case in which a cork obturator covered with a silver plate, was found in the throat of a woman whose death was supposed to have been caused by poisoning; the obturator had fallen into the pharynx and occasioned asphyxia. This accident, however, is said to have occurred with false teeth, and would not be urged against the wearing of these useful appendages. Nevertheless some danger may possibly be apprehended from obturators, especially if composed of several different parts and badly adjusted.

Kingsley's obturator appears to be ingeniously adapted for occluding the buccal from the nasal cavity; this instrument is in part composed of soft rubber, having on each side a deep groove which fits each lateral half of the soft palate, and the movements caused by the contractions of the undeveloped muscles of the cleft velum are communicated to a thin rubber curtain which supplies the offices of the natural velum. Other obturators, with perhaps very few exceptions, probably fail to afford as good results, and I have no doubt that the success which is said by some to attend the use of this instrument, is mainly due, entirely independent of its correct

principle of action, to the peculiar mechanical skill with which this obturator is adjusted to the mouth of each patient. The extreme probability of this supposition is attested by the skilful and intelligent co-operative mechanical assistance which this dentist has afforded to certain surgical attempts at reparative operations about the face.

Mechanical approximation of the maxillæ has been attempted in young subjects affected with cleft palate, and with variable success. Jourdain used metallic wires, fastened to the teeth. Levret, Autenreith, and Dupuytren, either by a properly devised apparatus, or extemporaneous means such as compresses and an ordinary roller, exerted a very forcible compression on the maxillary bones from without inward. Successes by this mode of treatment are attributed to Pointe, of Lyons, and Maunoir, of Geneva. This method has generally produced only incomplete results, and, besides, is painful and difficult. Dr. Louis A. Sayre informs me that he has obtained a most excellent result by this mode of compression.

It is impossible for me at present to determine the full extent of the usefulness of Langenbeck's operation on the speech; but I feel convinced that in most cases of congenital and acquired defects of the palate this operation should be preferred to other modes of treatment, as affording a permanent means of relief, and as a far more certain surgical procedure than any that has heretofore been attempted for cleft of the palatine vault. This operation may be especially productive of good results in those cases in which there is a moderate sized fissure of the bony palate, and a good development of the lateral halves of the cleft velum. Langenbeck thinks, however, that there is no form of cleft palate to which one of his three methods of operating may not be advantageously applied. In acquired defects of the palatine vault, when possible, this operation should always be selected as offering the best results of any mode of treatment.

NEW YORK, 23 FIFTH AVENUE, June, 1868.

FIG. 13.—Front view of hook, or hoe-shape raspatorium.

FIG. 13a.—Side view of same.

FIG. 14.—Needle instrument.

FIG. 14a.—Suture holder.

FIGS. 15, 16, 17.—Front views of the curved blunt periosteal elevator of different sizes.

FIGS. 15a, 16a, 17a.—Side views of the same instruments.

Fig. 13.

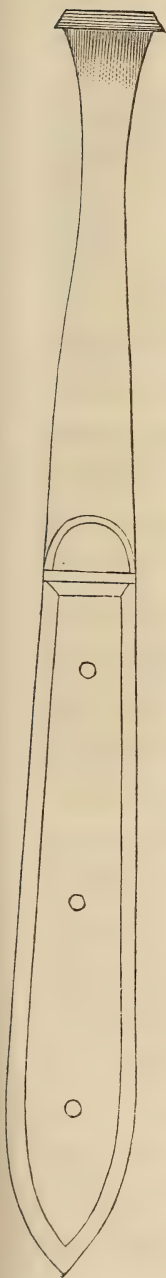


Fig 13a.



Fig. 14.

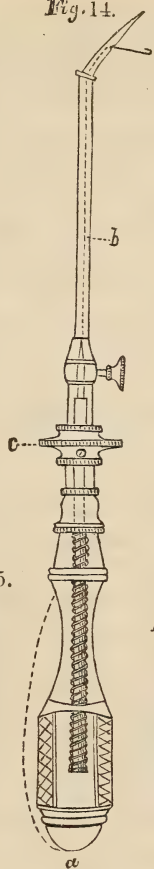


Fig. 14a.



Fig. 17.



Fig. 17a.

Fig. 15a. Fig. 15.



Fig. 16.

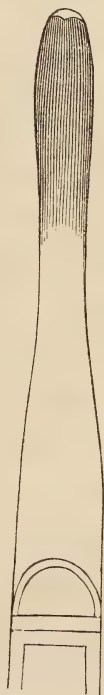


Fig 16a.



$\frac{1}{2}$

ART. VIII.—*On the Different Modes of Preparing the Sponge Tent, with Directions for making it Antiseptic, and Remarks on its various Uses.*

By GEORGE SYNG BRYANT, M. D. (late of St. Louis), Lexington, Ky.

FOR the revival of the use of the sponge tent, in uterine contractions and diseases, we are indebted to Dr. Simpson, of Edinburgh, and for its more efficient and extended use to Drs. J. H. Bennet and Tilt, of England, and Dr. Sims, Batchelder, and Emmet, of this country. Drs. Batchelder and Roberts, of New York, have pointed out the value of the sponge, applied externally by compression in many forms of ulceration, tumours, enlargements of bones, etc., and also of the tent in healing sinuses, fistules, and abscesses. The sponge tent is now regarded by Gynæcologists as invaluable in the treatment of many diseased conditions of the womb, and indispensable as a means of correct diagnosis when it is necessary to explore the cavities of the cervix and body of the uterus.

The manner of preparing the sponge tent for use by surgeons prior to the last century, is not precisely stated, though all mention the prepared sponge. This was, probably, compressed sponge, soaked or not in melted wax, and shaped as the necessities of the case required. In the last century the sponge tent was improved by soaking the sponge in melted wax and then compressing it in a conical shape, the sponge having been previously cleansed and dried. At the present time the sponge tent is made by saturating it in gum mucilage, and then wrapping it with a cord upon an awl. This was first used, in its rough state, by Dr. Simpson, but has since been rubbed down with fine sand-paper by Dr. Sims. The latter advises that the tents be made from one to two inches long, and when fully expanded some to be larger and others smaller than the thumb; but I have met with cases requiring the use of tents both longer and larger.

The great objection to the sponge tent has been its retention of the secretions, allowing them to decompose in the uterus, and in some instances producing pyæmia. This absorbing quality of the sponge made it desirable to find a substitute for it as a uterine tent. The sea-tangle—"laminaria digitata"—was proposed by Dr. Sloan, of Scotland, for this purpose, and greatly improved by Dr. Greenhalgh. But this article is far inferior to the sponge except in the single quality of cleanliness. Some surgeons prefer the sea-tangle when the os is very small, not admitting even the most diminutive sponge tent. The usual plan of treating these very narrow constrictions has been with metallic stilettes, or wooden stems, until the os or canal was sufficiently large to admit a small sized sponge tent. But this slow process of dilatation I have long since abandoned, and am in the habit of resorting at once to the knife, opening up the os and cervix sufficiently to receive a small, carbolized sponge tent;

after which there is no further trouble in effecting dilatation to almost any desirable degree.

For opening the os and cervix I have added another blade, with a probe point, to Dr. Sims' blunt-pointed ball-and-socket knife. With this blade the nicking operation is perfectly safe; for the probe point can only find its way along the canal, and the cutting edge can do no more than follow the probe point, simply nicking the mucous membrane to the extent of the width of the blade, which should not exceed one-eighth of an inch.

If the objection to the sponge as a nidus for putrid secretions can be obviated it is evidently the best material yet known for dilating the os and cervix uteri. In the *American Journal of the Medical Sciences* of July, 1867, will be found a formula for making the sponge tent antiseptic, by Dr. J. C. Nott, now of New York. He prepares the sponge in the usual way, then saturates it with an antiseptic paste, composed of alum, acetate of lead, wheat flour, and gum-water, heated to the boiling point, and wraps it with gold-beater's skin. It is then punctured freely with the point of a small knife blade.

Mr. Robert Ellis describes (see *Amer. Journ. Med. Sci.*, January, 1868, p. 276) a method of carbolizing the sponge tent by passing threads saturated with carbolic acid through the centre of the sponge longitudinally, which is then rolled into shape and covered with cocoa butter, to which is added a little glacial carbolic acid.

For more than eighteen months past I have been in the habit of using ten or twelve grains of crystallized carbolic acid to one ounce of thick gum mucilage, prepared for saturating the sponge tent before being wrapped with cord. This mode of mine for making the sponge tent antiseptic is well known in St. Louis, and to many of the profession in Louisville and elsewhere. The carbolic acid not only renders the sponge antiseptic, but its styptic qualities add much to the efficiency of the sponge in many diseased conditions of the mucous membrane. In preparing the tent moderately coarse, elastic sponge should be selected. Cleanse it well, cut while wet into the exact shape and size preferred; saturate it with gum mucilage, prepared as before described, and wrap it on an awl, with a strong, coarse, well-twisted cord. The tent should be fusiform in shape, and wrapped from the small end, as directed by Dr. Sims, taking care to keep the layers of the cord as they are carried around the sponge with perfect regularity, in close proximity to each other. By leaving the screw threads—not cutting them down with sand-paper—the tent can be much more easily introduced; giving it a turn, as to an ordinary screw, in the act of inserting it. When made in this way the tent does not slip out, as a smooth one is apt to do; and it should not project more than one-eighth or one-fourth of an inch out of the os. The best instrument I have found for introducing the tent is a pair of small, straight forceps, with an attachment to the handles to make fast the blades. The tent, firmly fixed in the forceps, is

inserted as above directed, the uterus being held by a volsella or hook. The tent should always be slightly soaped, more particularly at the small extremity, to enable it to pass in with less friction.

For the last fifteen years the sponge has been fully appreciated by the gynecologist, superseding, in many instances, both the knife and cautery. Among the numerous uterine diseases and derangements which are most frequently benefited by its use may be mentioned the following: Granular erosions of the os and cervix uteri, which, when treated by the sponge, but seldom fail to disappear in a short time, and the mucous membrane becomes smooth and natural.

Fungoid granulations, which are often a source of great annoyance to the surgeon and distress to the patient, soon disappear under proper use of the sponge tent.

Fibrinous infiltration of the os and cervix may exist alone and in complication with many diseased states of the uterus; as erosion, fungoid granulation, subinvolution, ulceration, elongated neck, constrictions, and flexions with or without retroversion or anteversion. Not only will the infiltration disappear under the use of the sponge tent, but also the complicating disease. In hypertrophy of the womb, diseased action is not necessarily involved, as the excess of growth may be the result only of an increased nutrition. But with subinvolution of the uterus there is more or less of diseased action present. Involution is believed to be the result of fatty degenerescence of the muscular fibres of the uterus. Whatever arrests or prevents fatty degeneration may cause subinvolution. A hypertrophied womb thus produced is pathological. This state of the uterus is frequently accompanied with chronic inflammation and ulceration. In this form of hypertrophy the sponge tent acts with peculiar benefit, exciting the absorbents to take up all superfluous deposits or tissue. The bowels must be kept in a soluble state, much depending upon their condition in the treatment of most uterine diseases. Intra-uterine fibroid and polypoid tumours, when of small size, will sometimes be completely destroyed by the sponge tent in a few days, as stated by Dr. Sims in his work on uterine surgery. If the fibroid be small and intramural, it may be reduced in size, and possibly, in some instances, be removed completely by the long-continued use of the sponge tent, resting the patient three or four days in every week. Polypoids, when attached to the canal of the cervix, if of small size, yield readily to the pressure of the sponge tent. I have never used the sponge tent to remove a large sized polypus, for, unless the polyp be very small, I always resort to the scissors or the *écraseur*. I have frequently seen the enlarged glands of Naboth yield readily to the sponge tent; and I remember but one case that made any resistance to it, and that was finally cured by the use of the sponge.

I have alluded to the fact that the sponge tent is considered indispensable, as a means of diagnosis, and many uterine affections without its aid

would remain in doubt and obscurity. With it the interior of the womb can at present be explored with as much certainty as the vagina could have been forty-five years ago. We can now determine, by the use of the tent, whether the cavity either of the cervix or body of the uterus contains a polypoid or a fibroid; whether the tumour be large or small, hard or soft, sessile or pedunculated, and by sufficiently dilating the uterine cavity tumours can be removed with ease and safety. It is a blessing to woman that the days of Gooch's canula have entirely gone by.

By means of the sponge tent tumours in the walls, and even on the exterior of the womb, can be traced out with almost absolute certainty. With the forefinger of the right hand in the cavity of the uterus, and the forefinger of the left in the rectum, or the left hand placed upon the abdomen with firm pressure, but little of importance can escape the touch of the practised gynecologist.

The compressed sponge may be resorted to with confidence as a means of successful treatment in constrictions of the vagina, whether congenital or resulting from vaginitis, or other causes. The sponge should be well compressed; having been first shaped, while wet, with reference to the peculiar condition or contracted state of the vagina, and introduced as dry as possible. Smearing the outside of the sponge freely with simple cerate, after the cerate has been melted by a gentle heat, will insure an easy insertion. The sponge soon becomes moist by absorbing the secretions, and the walls of the vagina are put gradually upon the stretch. It is well not to use too large a sponge in the beginning, in order to avoid irritation of the mucous membrane. The softest and finest sponge should always be selected for this purpose. The sponge may be medicated before being compressed; but I have found it sufficient to inject into the vagina with the hips elevated a drachm or two of Price's glycerine, containing three or four drops of carbolic acid, before the introduction of the sponge, to protect the mucous membrane from irritation. This sponge should be removed twice daily, and discontinued for a day or two if it causes much irritation. I have recently treated a contracted vagina with distressing pruritus upon this plan, with the happiest results. In abortion or premature labour, where the os is rigid, the compressed sponge acts with safety and certainty, overcoming the rigidity in a few hours.

Dr. Roberts, of New York, was one of the first to propose this method of procedure in rigidity of the os, and I have resorted to it on several occasions in premature labour, and once in early abortion, and was well pleased with its action. In indurated and hypertrophied cervix, when the os is sufficiently open to permit a constant hemorrhage or drainage, yet too hard and unyielding to allow the ovum to escape, and yet the symptoms all indicate certain abortion, the sponge cannot be too highly recommended. When desirable, from deformity of the pelvis or other proper reasons, to induce premature labour, the sponge tent may be re-

sorted to as a certain and safe means of bringing on natural labour. Puerperal hemorrhage in early abortions may be sometimes arrested most speedily with the sponge tampon.

The practice of using the tampon in a hemorrhage occurring after premature labour, or labour at full term, is extremely hazardous; for, when the womb is large, damming up the blood with a tampon in the uterine cavity may lead to bleeding the patient beyond recovery.

I will now briefly allude to the uses of the sponge in general surgery. In the treatment of stricture of the urethra the sponge tent has been highly extolled. The tent should be well compressed and then carried through a canula or catheter with the distal end open so as to lodge the tent at the exact place of narrowing. A cord should always be fastened to it to insure its withdrawal.

In cases of stone in the female bladder the sponge tent has been used with good effect in dilating the urethral canal for the purpose of extracting the foreign body, proper care being observed to prevent the tent from slipping into the bladder.

The sponge tent exerts a beneficial influence upon the semi-mucous lining membrane of sinuses and fistules; modifying, in a short time, the action of the false mucous membrane, causing healthy granulations and rapid healing of the cavities. In anal fistules, when external and incomplete, the sponge tent, as prepared for the uterus, has been used with the happiest effect. It is worthy of remark that so long as the outlet to the sinus allows a free discharge, externally, of the matter secreted the fistula never becomes double or "complete." But when the outlet becomes closed, or nearly so, the accumulated contents pressing upon the septum, between the cavity and the bowel, will cause it to ulcerate through, thus making a double fistula. Now, if the sponge tent be resorted to before the septum is ulcerated through, the contents will be freely discharged externally and the cavity healed through its entire extent, making a permanent cure.

Ulcerations and wounds were successfully treated a hundred or more years ago by the application of soft sponge to their secreting surfaces. Absorption by the sponge of the irritating and poisonous secretions, not allowing them to be taken up into the system again, explains satisfactorily the *modus operandi* of the sponge treatment in wounds, ulcerations, and abscesses. I had frequent opportunities of witnessing the good effects of this treatment during the late war.

When the meatus auditorius externus has been narrowed by infiltrations around it, the sponge tent has been recommended as being among the best and most pleasant means of dilating the canal. The same means has been advocated for opening up constrictions of the nasal cavities, and I have used it in narrowing of the cavities after the healing of wounds about the nose with happy results.

Even in hæmorrhoidal tumours the sponge tent is said to have been

effective when shaped so as to enter the bowel an inch or two, and at the same time make firm compression all around the anus externally. Vegetations on the anus and penis have been removed by the compressed sponge. Morbid growths and tumours in the soft parts, especially those seated in or above the mammæ, bony tumours and enlarged joints have all been treated successfully by the compressed sponge. I used the compressed sponge frequently with success during the late war for arresting hemorrhage, when the vessels were small and the wound so situated that it was difficult or inexpedient to ligate the artery; applying the dry sponge firmly to the wound with a bandage, and afterwards wetting it with water to produce expansion.

PHENIX HOTEL, April 22.

ART. IX.—*Surgical Cases.* I. *Aneurism of the External Iliac of the Left Side, both Common Iliacs, and Lower End of Aorta; Ligation of the Aorta; Death.* II. *Removal of Retained Testicle complicated with Hernia and Hydrocele; Cure.* By HUNTER McGUIRE, M. D., Professor of Surgery in Medical College of Virginia, Richmond, Va.

I. *Aneurism of External Iliac, &c.*—W. F., negro, æt. 30 years, was admitted into Howard Grove Hospital, March 20, 1868. He states that about one week before, while pursuing his usual occupation, that of wood-chopper, he felt something suddenly give way in the lower part of his abdomen. This feeling was followed by nausea and great pain, the latter continuing with increasing severity to the time of his admission into the hospital. Upon examination there was found occupying the left iliac and part of the hypogastric regions, an aneurismal tumour about the size of a goose-egg, pulsating strongly and synchronously with the action of the heart, with slight and indistinct *bruit*. No pulsation can be perceived in the left femoral artery, but the limb retains its natural size and heat. The man's general health is good. He says the tumour has been gradually increasing in size since its first appearance, and that the pain in the tumour and left lower limb is daily growing worse. He was ordered to remain in bed, at rest, and to take three times a day 20 gtts. tinct. ferri chlor., 3 grs. acet. plumb., and 10 gtts. tinct. digitalis, and to allay pain and procure sleep, $\frac{1}{2}$ gr. of morphia at bedtime.

March 24. Seems better; tumour smaller; pain is less, and by the aid of morphia sleeps well during the night. Pulsation in tumour still strong, and *bruit* more distinct. No apparent difference in the temperature or size of the two lower limbs. Pressure or other manipulation of the mass gives no increase of pain. The aneurism is believed to involve the left external and part of left common iliac arteries.

26th. Worse to-day; pain greater; tumour larger, and tender to touch, with some increase of heat about it. Ordered veratrum viride in place of digitalis; the iron and acet. lead to be continued; morphia in larger doses at bedtime.

Finding that I could now partially control the circulation through the tumour by compressing the aorta, I directed the resident physician and resident students to make compression at intervals throughout the day and following night. The abdominal muscles were to be relaxed, and compression at a point nearly opposite to the umbilicus, made, as long as the patient could well bear it; then an interval of a few minutes' rest to be allowed, and compression repeated.

27th. The patient was not able to bear the compression for more than a few moments at a time, and then at long intervals; and after two or three hours the pain produced was so great that it was suspended altogether. The tenderness and heat of tumor have increased; pulsation seems nearer the surface, and the mass can be indented with the finger. Some febrile disturbance of the general system also exists. There is every indication that ulceration is going on. Directed all handling of the tumour, or attempts at compression, to be discontinued, and the morphia to be given twice daily.

28th. Had diarrhœa last night, and looks badly to-day. The pain, heat, and tenderness have diminished. Gave small doses of tannin and opium, which checked the diarrhœa.

29th. Diarrhœa returned again, but was arrested by tannin. There is now great tenderness and heat in the tumour; the pain is great and constant; has high fever; all medicine, except morphia, discontinued.

30th. After consultation with Professors Joynes, Wellford, and Cunningham, and Drs. Fairfax, White, Janeway, and others, I determined to cut down, and, if possible, ligate the common iliac above the mass. His bowels having been emptied by an enema, at 1 P. M. chloroform was given, and an incision made through the skin from a little in front of the cartilage of the last rib downwards and forwards to the crest of the ileum, and then forward to the anterior-superior spine. The muscles and fascia, for about an inch in extent, at the upper extremity of the wound, were then divided singly and successively upon a grooved director, and the peritoneum exposed. The index finger of the left hand was then introduced between the peritoneum and fascia, and making that a guide, the muscles and fascia were divided with a probe-pointed bistoury to the full extent of the original wound through the integument. In consequence of the establishment of collateral circulation, a large number of vessels were divided which required the ligature. Hemorrhage was, to a great extent, prevented by the assistants grasping the lips of the wound as the incision was made, and the ligatures were rapidly and skilfully applied by Drs. White, Cunningham, and Janeway, for whose valuable assistance throughout the operation I am much indebted. When the peritoneum was exposed, the mass of intestines enveloped in it was pushed inwards, and the aneurism brought into view. It was found involving the external iliac of the left side, the whole of the common iliac, as well as the aorta at its bifurcation. The anterior part of the sac was very thin, especially where it joined the aorta; there it was softened and attenuated by the process of ulceration, which had set in some days before. Determining now to tie the aorta, and being unable to reach it through the incision, I enlarged the wound by cutting from the end of the twelfth rib, where I had begun the operation, forwards and upwards, along the line of the costal cartilages for about one inch and a half. Still finding it impossible to see the aorta, and to separate it completely from the structures around it, I caught the tumor lightly between my finger and thumb, intending to follow it closely

up to the point at which it joined the aorta, and then, having separated the vessel from the parts about it, to surround it with the ligature. Conscious of the softened and readily lacerable condition of the coats of the aneurism, I did this as delicately as possible; but, notwithstanding my care, the sac suddenly burst under my fingers, and a profuse discharge of blood took place. Placing my finger at once upon the aorta, about an inch above the tumour, I succeeded in completely arresting the hemorrhage, and entirely controlled it until an assistant had surrounded the vessel with a ligature, and tied it. The blood, about one pint, which had escaped from the ruptured sac, was carefully removed from the cavity of the abdomen; the lips of the wound brought together with interrupted sutures; a compress and bandage applied; some whiskey and water injected into the rectum, and the patient put into a warm bed, covered with blankets, and hot bricks placed to his feet, legs, and thighs. His pulse was now feeble and frequent, and the surface of his body cool. In a few moments after being placed in bed, the effects of the chloroform passed off, and slight reaction took place; his pulse lessened in frequency, increased in force, and his body became warm. He was left in charge of the resident physician, Dr. John N. Upshur, from whom I have obtained the followed notes:—

5 o'clock P. M. Pulse 100, and weak; complains of numbness in lower limbs. Have given once by injection and once by the mouth, 1 oz. of whiskey and 10 gtt. tinct. opii each time; has vomited twice. 6 P. M. Pulse 100, but stronger; vomited twice in last hour. Drew off with catheter one ounce of urine; disposed to sleep, but is restless from the pain and numbness of lower extremities; temperature in axilla 96° ; popliteal space 89° ; feet 82° Fahr. 7 P. M. Pulse 80, and stronger; temperature $95^{\circ}.5$ in axilla; is sleeping quietly; respiration good; lower extremities warm; skin pleasant. 9.30 P. M. Has slept for two hours; pulse over 100; temperature in axilla 96° ; gave injection of whiskey, tinct. opii, and milk; respiration good; lower extremities warm; has fallen to sleep again. 10.30 P. M. Is awake, restless, and complains of pain; pulse very weak and frequent; temperature 95° in axilla; gave, per rectum, egg-nog. 12 o'clock. Has been very restless for the last hour; respiration hurried; pulse cannot be counted; temperature 96° ; gave whiskey by mouth and rectum, but neither retained; sphincter ani relaxed. Died at 12.30 A. M.

Autopsy twelve hours after death.—Abdominal viscera healthy; no blood in abdomen or pelvic cavity; aneurism found to involve aorta from the origin of the inferior mesenteric artery to the bifurcation; the common iliac of right side to its division into external and internal iliacs; and the common and external iliacs of left side. The ligature was found embracing the vessel at the origin of inferior mesenteric, and included the left ureter, which was deeply imbedded in the fibro-cellular structure of the aneurismal walls. The rent in the sac was about half an inch long, and situated just over the bifurcation of the aorta.

In this case there was every indication, before the operation, of advancing ulceration of the sac, and the death of the patient was imminent and certain. It was with the hope of finding a part of the common iliac uninvolved, and not with the intention of ligating the aorta, that the operation was begun. As the disease commenced in the external iliac, and the enlargement of the tumour was from below upwards, it was thought not unlikely

that a sacculated aneurism of the external iliac had formed, and, as it increased, overlapped the common iliac. When, however, the sac was exposed, its extent and nearly ruptured condition discovered, I resolved to give him the only chance for life, and to tie the aorta. The left ureter was so deeply imbedded in the wall of the sac, that it was difficult, after death, to dissect them apart without opening the cavity of the aneurism at that point.

II. *Retained Testicle*.—C. W. B., æt. 32 years, came to me Dec. 1867. He states that he was born with the left testicle retained in the abdominal cavity. When about twenty-three years old, a hernia of the left side suddenly appeared, while he was engaged in some unusual muscular exertion. No pain attended the descent of the hernia, his attention being attracted to it by a slight sensation of weakness in the parts, and on examination he discovered a tumour occupying the inguinal canal and upper part of the scrotum. His physician returned the protrusion and applied a truss, which he wore for five or six months, but finding at the end of that time that the descent of the hernia gave him no pain, he discontinued the use of the instrument. From the time of the first appearance of the hernia until his thirtieth year, a small tumour, which his physician supposed to be a lymphatic gland, could be felt in the upper and outer end of the inguinal canal, in front of the internal ring. The hernia, consisting of a portion of the small intestine, came down into the scrotum, and lower end of the inguinal canal, and returned readily into the cavity of the abdomen, when he assumed the recumbent posture. Several times during this period he was threatened with strangulated hernia, but always succeeded in reducing the protrusion himself, by taxis, position, and the warm bath.

Some time during his thirtieth year, he believed the hernia to be increasing in size, and he applied a truss with a hard pad and strong spring, so low down that it pressed upon the external ring, upper part of the scrotum, and he thinks, upon the urethra. The truss gave him a good deal of pain, but he continued to wear it in this way for more than three months. Soon after he commenced wearing this truss, his bladder became affected, micturition was frequent and accompanied with a burning sensation about the neck of the bladder. Incontinence of urine, to a greater or less extent, came on, and his clothes were frequently wet with urine. All desire for sexual intercourse, strong enough before, ceased. A surgeon, whom he now consulted, changed the truss for one with a softer pad and lighter spring, and directed him, after reducing the hernia, to wear the pad over the internal abdominal ring. He gave him, also, bromide of potassium. Obtaining no relief from the change in the position of the truss, or from the medicine, he applied to another surgeon, who treated him, he said, for inflammation of the seminal orifices, by introducing a catheter, and injecting a solution of nit. silver. This gave him great relief, and for some time he supposed a cure had been effected, but in a few weeks the vesical trouble returned as bad as ever.

In December, 1867, he applied to me. He was in bad health and mentally greatly depressed. His face wore the expression of one who was continually suffering. When the truss was left off and the hernia permitted to come down, the pain and burning sensation about the neck of the bladder, frequent micturition and dribbling of urine would take place, and when the truss was applied and its pressure continued over the internal ring, for a

few moments, the same symptoms would occur. The only relief he could get, was by the recumbent position. Upon careful examination there was no doubt that the little swelling at the upper end of the inguinal canal, was the testis of that side, imperfectly developed, and probably with the vas deferens too short to permit it to come lower down. Pressure upon the testis, either by the truss or by the hernia, when permitted to escape from the abdominal cavity, produced the unpleasant symptoms about his bladder.

The patient was an intelligent and well-educated man, and being tolerably familiar with the anatomy of the parts, readily understood my explanation of his case. He was advised, before submitting to any operation, to endeavour to return the bowel into the abdominal cavity, and leaving the testicle in the inguinal canal, to make pressure over the internal ring with a very small pad. This failed entirely. It was impossible to get the testicle far enough away from the internal ring to apply the truss, without pressure upon the gland. I then reduced the hernia and returned the testis into the abdominal cavity and endeavoured to keep both within the internal ring by pressure. This also failed to relieve the troublesome symptoms. I then had made for him a truss with a deep cup-shaped pad, hoping to be able to retain the hernia and allow the gland to remain in the inguinal canal, but lodged in the hollow of the pad and free from pressure. This also failed to effect any good, and he urged me to remove the testis. He was aware of the danger and fatality which, in some cases, had attended the operation.

January 10, 1868. The bowel having been carefully returned into the abdominal cavity, and the testicle held between the finger and thumb of an assistant, to prevent its escape through the internal ring, chloroform was given and an incision made through the skin over the inguinal canal, from a point opposite to the external ring, to half an inch beyond and to the outer side of the internal ring. The fascia and other structures were divided upon a grooved director, and the inguinal canal laid open. The upper end of the canal was occupied by what I supposed to be a knuckle of the small intestine. I tried to return this, but it protruded again whenever the pressure was removed; I then attempted to pull it further out, but found it adherent to the sides of the internal ring. Examining it more closely I found it to be a pouch of the peritoneum containing the testicle. When it was opened about half an ounce of fluid escaped, and the testis was fully exposed. The gland was small, imperfectly formed, and, as we afterwards found, its glandular tissue presented the immature character of the organ of a child. Passing a loop of silk through the spermatic cord, close to the testis, to prevent any chance of retraction of the cord through the internal ring, I cut off the testicle, and tied two or three branches of the spermatic artery which required the ligature. The loop of silk and the ligatures were brought out at the upper angle of the wound; two or three interrupted silver wire sutures introduced, and a slight compress and bandage applied. No untoward symptom, except a slight attack of colic, from imprudence in eating, occurred, and by the twelfth day the wound closed and he was permitted to get up.

Up to this time, nearly six months, no return of the hernia has appeared; once, before the wound closed, and again, about one month after the operation, the old vesical symptoms threatened to return, but after a few hours they disappeared, and he is now, he informs me, as well as he ever was in his life.

ART. X.—*On a New Duck-bill Speculum, for Private Practice.*

By J. C. NOTT, M. D., New York. (With two wood-cuts.)

THE fact that every new month brings forth a new vaginal speculum, is sufficient evidence that all the indications have not yet been fully met. I here present one more to the profession, which acts on a somewhat different principle from those in use; and although it may be modified in shape to suit the fancy of other practitioners, I feel much confidence that the principle will hold good.

This speculum—at least in my hands—has answered far better than any I have yet seen, the requirements of the *private practitioner*, who is compelled to go from house to house to examine his patients, where he cannot command trained assistants, a suitable table, a horizontal light, etc., but is obliged to take things as he happens to find them. I have for some months been working with this speculum constantly and to my entire satisfaction. Like every other new instrument, it requires a little practice to become familiar with its manipulation. The makers of this instrument are Messrs. Geo. Tiemann & Co., Chatham Street, New York, and to their ingenuity and patience am I indebted for success. I could only suggest, but it required the ingenuity of a thorough mechanic to carry out the principles I had in view.

No one who has worked much in uterine surgery, and tested fairly the lever speculum of Sims, and the various forms of valvular and cylindrical specula, can deny that the former possesses important advantages over all others. I believe I may safely say that there is scarcely anything that can be done with others, that cannot be equally well done with the instrument of Sims, while the latter has many applications peculiar to itself.

The leading advantages of Sims' speculum are briefly these: It enables us to explore the vagina more satisfactorily than any other, as it covers but a small portion of the canal, and its position is quickly changed. Where the vagina itself is diseased, or sensitive, it is greatly preferable, as it presses on but one side, and leaves the atmospheric pressure to complete the dilatation. During operations the position and direction of the instrument can be changed by the assistant, at a moment's warning, to suit the wishes of the operator. It obstructs less the view and manipulations than any other speculum heretofore used. Not putting the vagina on the stretch *longitudinally*, it allows the uterus, by slight traction with a tenaculum, to be brought near the vulva, and thereby greatly facilitates cauterizing, probing, and all cutting operations on the cervix, introduction of tents, etc. Nothing need be said about its triumph in vesico-vaginal fistula.

It would be a waste of time to enumerate the objections, now so generally admitted, which may be made against the cylindrical and common valvular specula; suffice it to say that their utility is limited to but few

conditions—that they act on principles the reverse of the instrument of Sims—they dilate the vagina simply by mechanical force—they cover the whole vagina from view—they *push the uterus away* from the operator, and are of little service beyond affording an excellent view of the os and lips of the uterus, and of allowing the easy application of caustics or other remedies to these parts. Where flexions or versions of the uterus exist, they do not even admit the introduction of a sound without unjustifiable violence, and from the length and narrowness of the channel through which we hope to manipulate, they are utterly useless in all cutting operations. The ingenious instruments of Drs. Emmet, T. Gaillard Thomas, and Bozeman, have been fully described by their respective inventors, and any fair comments upon their respective and acknowledged merits would far transcend the limits here allowed me. I would remark, in passing, that I do not think either one well suited to the wants of the *private practitioner*. To get at the cervix uteri they all require either the semi-prone position or that on the knees; they consequently require an elevated table, and a light horizontal with the table, to give a good view, all of which conditions are inconvenient in private houses. Dr. Thomas' modification of Sims' speculum requires to be held by one hand, and therefore leaves but one free. Dr. Emmet (whose operations are all performed in hospitals, private or public) frankly said to me that Sims' speculum is superior to all others, and that he rarely uses any other. His object in contriving a new instrument was not for his own convenience, but for that of others; and the profession is certainly greatly indebted to him for his success. The operation of vesico-vaginal fistula, and most other vaginal operations, can be well performed with his instrument. The instrument of Dr. Bozeman is peculiarly adapted to the operation of fistula as I understand it, and the modifications of Sims' speculum, and that of Cusco by Dr. Thomas, though excellent instruments for most purposes, are wholly inapplicable to the operation of fistula. But there are insuperable objections to the speculum of Sims in *private practice*. It requires, for the simplest manipulations, a table from two and a half to three feet high, and a horizontal light; it requires a trained assistant to manage it; and the patient must be placed in the semi-prone position, with the head lower than the hips, which is very constrained and fatiguing if long continued.

We might just as well attempt to popularize the fracture beds of Jenks or Daniels, as the speculum of Sims; and from its bulk, costliness, and liability to be broken in carrying it about, the instrument of Dr. Emmet, with all its merit, is not, I fear, destined to come into general use.

I may remark, by way of parenthesis, that the operation of vesico-vaginal fistula has long since ceased to be one of the wonders of the world. The rules for its execution are so well defined, and the operation now so simple that any one of ordinary dexterity can perform it. In this operation assistants are indispensable, and I do not see that it really requires

any more perfect instrument than that of Sims, unless in a few exceptional cases—perhaps in some very fat women. Dr. Emmet, with Sims' speculum, and a few simple instruments, performs it two or three times a week; and I have repeatedly seen him do it, as also his operation for pro-cidentia, with the utmost dexterity and dispatch.

Like lithotomy and ovariectomy, these operations are comparatively few, and rarely fall into the hands of any but specialists. *What most practitioners want is a speculum for every-day use*—one which will enable us to explore readily the vagina and uterus—to introduce a sound—to introduce tents—to split or amputate the cervix with scissors, etc., all of which I have been doing for months past with my speculum, and with quite as much and more ease than I could with that of Sims.

In very large fat women, from the disposition of the vagina and bladder to crowd in, in front of the os uteri, my instrument (as that of Sims and all others that I have seen used) meets with difficulty; but these exceptional cases are few and far between. Dr. Bozeman claims to have overcome this difficulty in the operation for fistula, and his experience gives full weight to his assertion.

The following are the advantages I claim for the instrument I introduce to the profession:—

1. No instrument hitherto devised can be more easy to introduce.
2. It can be equally well used in the semi-prone position or on the back.
3. While elevating or depressing the perineum, its feet are so constructed as to expand the *ostium vaginæ* to any desired extent.
4. It is perfectly self-retaining, without any arrangement external to the vagina.
5. In the semi-prone position it has the same advantage of atmospheric pressure as the lever speculum of Sims, and when the patient is on the back, by elevating the hips with a cushion or pillow, you have the same advantage of atmospheric pressure.
6. I use the instrument almost entirely with the patient on the back, because the position is more comfortable; because I can do everything I wish to do with more facility; and because the light from any window is more easily commanded. The concave surface of the speculum looking upwards, catches and throws the light fully on the anterior wall of the vagina and os uteri.
7. For all ordinary manipulations, where no cutting is required, instead of a table, any common bedstead or couch will command the light sufficiently from almost any window to give a good view. Baker Brown, in his operations for vesico-vaginal fistula, while using Sims' speculum, places the patient in the lithotomy position.
8. Like Sims' speculum, mine does not stretch the vagina *longitudinally*, and therefore allows the os uteri to be drawn down with a tenaculum near to the vulva.

9. The anterior wall of the vagina being left free, more space is afforded for operations.

10. With this speculum there are few operations that cannot be easily performed without an assistant.

I have also added, in some of the instruments, a small tenaculum, two inches long, with a little chain, any link of which may be made to catch on to a knob at the heel of the instrument. With a pair of forceps the tenaculum is fastened into the anterior lip of the uterus, and then drawn out and fixed at any point we desire.

I should remark that I have not yet tried this instrument in a case of vesico-vaginal fistula, and do not think it would answer well in any but small openings. By shortening the feet of the instrument, however, they would be out of the way, and the instrument would still be self-retaining. The feet need only be long enough to curve around the rami of the pubes, and thus not press upon or stretch the bladder; with this alteration I see no reason why it should not answer well for vesico-vaginal fistula.

It may not be amiss to say a few words in favour of a simple contrivance for office use (or elsewhere), to answer the purpose of an operating table, or expensive chair. It is simply a small cot, or large camp stool, covered with strong sail-cloth, or, what is better, raw hide or stout leather, these being more durable. Have the framework made exactly like a cot; but the horizontal bars, to which the canvas is tacked, only three and a half feet long. The sacking should extend three feet from one extremity, and within six inches of the other extremity, so as to leave the bars extending six inches beyond the edge of the canvas at one end. When the canvas is tacked on, the cot should be but two feet wide, and the height about two feet eight inches. The free ends of the bars should each have three perpendicular auger-holes bored in it, into any one of which a peg of wood, four or five inches long, may be inserted. The woman is then laid on the cot on her back, with a foot resting against a peg on each side, and the nates drawn down to the edge of the canvas. She is thus placed and comfortably maintained in the lithotomy position, which is the best for nearly all manipulations. If preferred, she can equally well be placed on the side, or in the semi-prone position.

The advantages of this cot are, that it is cheap; it answers all the purposes of the most complicated and expensive operating table; it can be folded up, set aside, or taken up by a boy and carried about from place to place when needed, and is more comfortable to lie on than a table.

Directions for Using the Speculum.—The depressor being retracted, and the instrument closed, the palm of the hand is placed over the outer opening of the instrument; the end of the thumb is placed on the back of the duck-bill, and the index and middle fingers curved over the heels of the feet—the blades are all thus firmly compressed together. Pass the instrument into the vagina as far as it will go, the end of the duck-bill gliding

along the posterior wall of the vagina, and the curved feet well within the arch of the pubes. Then turn the button on the screw until the perineum is pushed sufficiently out of the way, and the ostium vaginae is well opened. In women who have had children, the instrument may be slowly expanded nearly or quite to its full limits. Then, if the os uteri is not in view, push the end of depressor forward, and sweep it around to the central line to hold up the wall of vagina, and bring the os uteri in view. This is the only difficult point to the novice, but is easily overcome by a little practice. In some cases, as with Sims' speculum, a small tenaculum, hooked in the os uteri, will facilitate the view by bringing the uterus lower and changing its axis.

In fat women the same difficulty exists with this as with all other specula, in probing and in all cutting operations. I have not used this instrument with the patient on the knees, but the principle and action here would be the same as the lever of Sims; the action of the air would be the same.

Caution.—Nitrate of silver and other chemicals act on plated instruments, and when I apply them to the os uteri, I always stuff a little cotton between the uterus and instrument to protect it.

The following wood-cuts represent the instrument with the feet upwards, the attitude in which I most frequently use it.

Fig. 1. The instrument as expanded, after being introduced.

Fig. 2. The instrument closed, preparatory to introduction.

If the reader will turn the drawings upside down, he will probably form a better idea of the shape and construction of the instrument. The two feet *b, b* are intended to stand firmly on the rami of the pubes, while by turning the button on the screw, the duck-bill or lever recedes and carries with it the perineum.

Fig. 1 represents the instrument with the feet upwards, as it is used when the patient lies on her back.

a, the duck-bill, corresponds with the Sims' lever, and acts on the perineum in the same way.

b, b are the two feet, which rest on the rami of pubes, and are so shaped as to curve smoothly around the bones, and not to press on their sharp edges.

c, is the depressor (or elevator, according to the position of the patient), which may be pushed forwards or drawn backwards, and swings around from side to side, like an oar on a pivot, so as to press out of the way the anterior wall of the vagina. This is a very convenient appendage when the patient is on the back, but may be dispensed with when the instrument is used in the semi-prone position. It is easily slipped out by unscrewing the little button, *d*, on the end.

I should remark that this depressor is the only part of the instrument that is likely to give the inexperienced operator any trouble. It should not be too much curved, and when pushed forwards to its full extent, should stand in a

line with the axes of the feet of the instrument. It is malleable, easily bent, and very little practice will enable the operator to shape it properly.

FIG. 1.

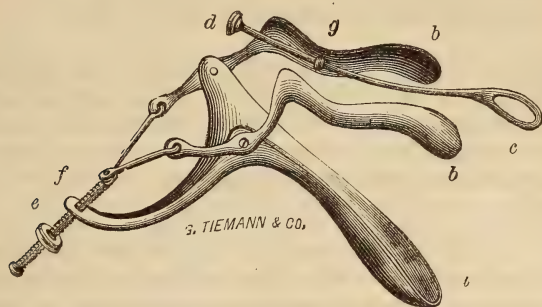
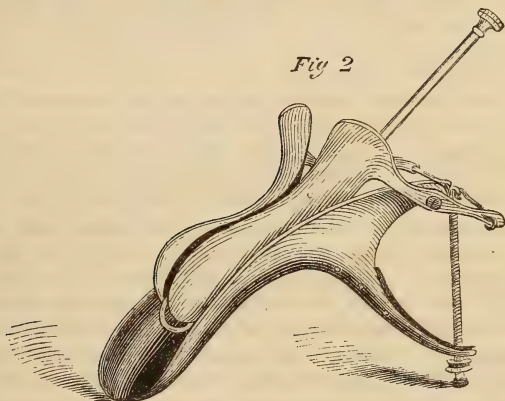


Fig 2



e, is the button which plays up and down the screw, expands or contracts all the blades simultaneously, and fixes them at any point to suit the capacity of the vagina.

f, is the screw which opens or closes the instrument.

After the operator has secured a good view of the os uteri, should he wish to draw the uterus nearer to the vulva, this is easily effected by catching the anterior lip with a tenaculum, and drawing it down, while the depressor is retracted and taken out of the way.

ART. XI.—*Case of Retroversion of the Gravid Uterus, Replaced by the Introduction of the Colpeurynter into the Rectum.* By Dr. J. GOODMAN, of Louisville, Ky. (Communicated by Prof. HENRY MILLER.)

THE subject of this case was a healthy, robust woman, thirty-two years of age, the mother of six children. All her former pregnancies had been natural and her labours easy. Two weeks prior to being seen by us, she was suddenly seized, while asleep at night, with a severe pain in the abdomen accompanied by a sensation of weight and bearing down, and upon endeavouring to pass water, found that she was unable to do so. These symptoms continuing, the next morning she sent for her usual medical attendant, who drew off her urine and allayed the pain with opiates. After several days, no improvement being manifest, a consultation was held and an examination instituted, resulting in a diagnosis of ovarian cyst prolapsed into Douglas' *cul-de-sac*, for the relief of which, tapping through the rectum was determined upon. The patient, however, being averse to an operation, delay ensued, and finally refusing positively to submit to it, she was given up by her physicians.

It was at this juncture, thirteen days after the trouble originated, that the patient was seen by Prof. Henry Miller and myself. She was suffering greatly from distension of the bladder, and upon introducing a catheter upwards of six pints of dark-coloured, ammoniacal urine was evacuated. An examination *per vaginam* discovered the os uteri high up above the symphysis pubis, while posteriorly, between the vagina and rectum, there was a large, rounded tumour, the continuity of which with the os and cervix was easily traceable. The aspect of the case, so far, impressed us with the idea that it was one of retroversion of the gravid uterus, and upon inquiry, we found that the patient believed herself to be four months advanced in pregnancy, it having been about that length of time since she last menstruated. The diagnosis being thus confirmed, we determined, in the first place, to give the organ an opportunity to resume its natural position by unloading the bowels with an aperient and keeping the bladder empty. This was persisted in for four days, when, no change having taken place, an unsuccessful attempt at reposition was made. It was now evident that more energetic measures were necessary for the patient's relief. Accordingly, on the following day she was brought under the influence of chloroform, and being placed on her back near the edge of the bed, Prof. Miller endeavoured by means of the hand, introduced into the rectum, to elevate the fundus above the brim of the pelvis; after a persistent effort, however, in which as much force was used as was deemed compatible with the integrity of the parts, sufficient, in fact, to lacerate the mucous membrane of the rectum and cause slight hemorrhage, he only succeeded in dislodging the fundus to some extent, and rendering it more movable. A medium sized colpeurynter was then introduced into the rectum and distended with air; this produced violent expulsive efforts, to allay which it was found necessary to administer an opiate, but tolerance of the foreign body being at length acquired, the patient was left in a moderately comfortable condition. Upon returning in about six hours, I was delighted to find that everything we had hoped for from the colpeurynter had been accomplished. The fundus uteri had gone up and was now easily felt above the symphysis pubis, and the os was in its normal position within easy

reach of the finger. The patient declared herself entirely relieved, and as soon as the colpeurynter was removed voided her urine without the slightest difficulty. In a few days afterwards foetal movements became manifest, and since then (two months ago) pregnancy has progressed naturally.

The interesting features in this case are—First, the occurrence of the accident without any assignable cause, coming on as it did, while the patient was quietly asleep, having passed her water only two hours previously upon going to bed. Secondly, the serious mistake in diagnosis made by physicians of considerable experience, which came very near leading to the performance of an useless and hazardous surgical operation. And thirdly, the conjoint use of taxis and the colpeurynter *per ano*; a procedure I would strongly recommend, particularly in cases of sufficient standing for partial impaction to have taken place. The taxis being premised with a view of disengaging the fundus and slightly elevating it so as to procure a lodgment for the colpeurynter immediately beneath.

ART. XII.—*Case of Vaginismus: treated after the Method of Sims, by Ersection of the Hymen and Meatus Urinarius, etc. etc.* By JOSEPH WORSTER, M. D., of New York.

Aug. 1, 1867, was consulted in relation to Mrs. G., aged 20 years, married for eighteen months; *coitus* had during that period been impossible, owing to the excessive irritability and tenderness of the vulva, vagina, and surrounding parts.

Upon examination under anæsthesia, these parts were found to be naturally conformed. The uterus was natural, and *in situ*. The hymen admitted of great distension with the two fingers of the right hand forcibly separated; but the irritability returned as the effects of the chloroform passed away.

I deferred operating for two months, owing to the heat of the weather; but, at the end of that time no abatement whatever had occurred in the severity of the symptoms. On the 1st of October I performed the following operation: The patient being under the full influence of chloroform, assisted by W. P. Worster, M. D., and laying her on her left side, the limbs well drawn up and separated, I seized the hymen with a delicate pair of forceps, and with a small pair of very sharp curved scissors, dissected out the whole of the ring, about four lines in thickness, including the meatus urinarius. The hemorrhage was slight, and less than I had expected. The hymen was about the circumference of a five-cent piece. The loss of blood having been so slight, I determined to proceed forthwith to finish the remainder of the operation. Placing the patient on the back in the position for lithotomy, I passed the first and second fingers of the left hand into the vagina and extended them to the uttermost; I then made an incision on either side of the posterior wall, obliquely in a line from the sacro-iliac symphysis to the sphincter vaginæ, in the median line. This V-shaped double incision, of depth sufficient to divide the muscular fibre, was continued from the point of junction forward through the raphe and sphincter

of the vagina to within half an inch of the anus, thus converting the V into a Y-shaped incision. These last cuts were made with Simpson's uterotomy, as better adapted for making deep incisions in parts partly out of sight, and less liable to wound the finger. They were about one-third of an inch in depth. After arresting the hemorrhage, which was profuse, I packed the wounds and vagina with cotton saturated with glycerine, distending the orifice of the vagina to about one and three-quarter inches, and then applied a T bandage. The packing was retained for five days.

On the following day, when visited by my son Dr. W. Parker Worster, she was found with a good pulse and easier than had been expected.

On the 5th, under chloroform, the packing was removed, and a glass dilator—a cylinder two and a half inches in length and one inch and a quarter in diameter, closed and rounded at its upper extremity, its edges everted at the other, and having on its upper surface a depression to receive the urethra—was introduced. The patient rested well. On the 7th I removed the dilator, and after cleaning it and the parts, reintroduced it, the patient, at this latter moment, being under the influence of chloroform.

Oct. 11. Repeated this proceeding without the use of chloroform; the patient suffering very little pain.

15th. Removed dilator, telling patient to reinsert it every night and morning; applied nitrate of silver to expedite the cicatrization of the intra-vaginal wounds; she sat up to-day for some hours.

16th. Sat up all day and left in the dilator all night; 20th, went down stairs, and 24th, walked out by herself.

26th. Improvement continues; the wounds are nearly healed, with only the exception of a small fissure in the lower and posterior floor of the vagina, to which a weak solution of nitrate of silver is applied. Surgically speaking, the cure of the patient and cicatrization of the incisions may be said to be complete, and with little or no contraction of the vagina.

The term "vaginismus" seems to have been given to this affection—which consists in an excessive hyperæsthesia of the hymen and vulvar outlet, associated with such involuntary spasmodic contraction of the sphincter vaginae as to prevent coition—by Dr. J. M. Simms, who, in his recent work on "Uterine Surgery," has minutely described its symptoms, and recommended for its cure the operation repeated in my case. He reports several cases of the affection and several *cures* by the operation, which, he says, is "easy, safe, and certain." On page 330 (*Uterine Surgery*) he states, "I have now operated on thirty-nine cases of vaginismus, and in every instance with perfect success." To this list of successes, in a condition of things calculated to cause much suffering, both moral and physical, I am happy to be able to add my own.

The husband of my patient informs me (November) that the conjugal act is now effected without pain or repugnance; and this day (Aug. 12, 1868) she is reported to me as being far advanced in pregnancy, and in excellent health and spirits.

A second case has since occurred to me treated in like manner, and, so far, with similar success, as to the facility of conjugal intercourse and the speedy recovery of the patient.

TRANSACTIONS OF SOCIETIES.

ART. XIII.—*Proceedings of the Clinico-Pathological Society of Washington, D. C.*

1866. June 2. *Puerperal Convulsions*.—The following case was reported by Dr. D. W. PRENTISS:—

Mrs. S., aged 18 years, primipara, at full term. Intense headache came on Jan. 22, which continued up to afternoon of 23d, when it culminated in a convulsion. First saw the patient at one o'clock A. M., Jan. 24, when another convulsion occurred. She was at this time perfectly unconscious; the body and limbs strongly convulsed; the bloodvessels of the head turgid; the breathing stertorous; and, in fact, the regular symptoms of an apoplectic seizure. There was no indication that labour had commenced, and no *per vaginam* examination was made. Venesection was determined on and practised to the amount of about twenty ounces; and a mixture containing one-fourth grain tartar emetic and one-eighth grain opium to each dose ordered every two hours.

Jan. 24. Saw the patient again at 9 A. M., when she was sleeping comfortably; had had no return of the convulsion; pulse 120, compressible; headache not so severe; stopped antimonial mixture and ordered sweet spirit nitre in small doses.

Was sent for in haste at 10 A. M. (one hour later) on account of return of convulsions. The attack was more severe than the one during the night; one convulsion following another in quick succession. A vaginal examination showed that labour had commenced; the os uteri dilated to the diameter of about one inch; vertex presentation, but pains feeble and irregular. Pulse 160, and seemed to be growing more frequent and weaker; respiration quick and spasmodic; convulsions rapidly became more frequent until there was no intermission between the paroxysms; the countenance dusky, purple and swollen; foam issued from the mouth, made bloody by the wounded tongue; death seemed impending from oppression of the brain. Upon consultation with Drs. M. V. B. Bogan, W. B. Butt, and Chas. H. Bowen, the membranes were ruptured with the hope of hastening the termination of the labour, and this failing, "version of the feet" was determined upon as a last resort, although there was but the slightest chance of success. Forceps were not applied because of the position of the head and on account of the convulsive movements of the patient. "Turning" was performed differently from the prescribed manner. The patient lay on her back, thighs and knees flexed, and held by assistants, who also controlled the spasmodic motions, upon which, I should mention, chloroform failed entirely to produce any effect; two other assistants held the shoulders. I prepared the *right* hand and commenced the operation. The soft parts were in a perfectly favourable condition; the "os" dilated to the diameter of one and a half inches; the head engaged in the superior strait, and the uterus firmly contracted. Dilating the "os"

occupied about half an hour before the hand could be passed into the cavity of the womb. The presentation was then carefully made out, vertex to left acetabulum, and the hand passed over the face along the anterior portion of the body until both feet were firmly grasped, and turning commenced. This, however, proved to be not so easy a matter as had been anticipated. The head refused to recede, and it was only after persistent effort, forcing up the head by external pressure, at the same time making traction upon the feet, during which one foot was lost, that I succeeded in bringing a foot through the mouth of the womb into the vagina. During this time it was necessary frequently to suspend efforts, and partially withdraw the hand on account of pressure, first, from the *os uteri*, and secondly, from the child's head against the bony boundary of the superior strait. A tape was attached to the ankle and the child shortly delivered. The placenta followed without trouble in about fifteen minutes. Child female; stillborn; weight, $10\frac{1}{2}$ lbs.; duration of operation from beginning until head was born, *two hours*.

Almost instantly after the birth of the head the convulsions ceased, and the patient fell into a deep sleep. Pulse 130; respiration a little slow. It will be remembered that at the commencement of the operation the pulse was 160 and very feeble, and the respiration quick and spasmodic; a marked contrast. The patient was now put on the following treatment: Carb. ammon. gr. v, every two hours; beef essence f3ss, every hour; inunctions of mercurial ointment twice daily; and frictions with whiskey to extremities. The binder was firmly applied, and wine of ergot left to be given in case of hemorrhage; the room was darkened, all bright hangings removed, and the most perfect rest enjoined.

$5\frac{1}{2}$ o'clock P. M. Pulse 140, weak; some hemorrhage; has not been awake since operation. 9 o'clock P. M. Pulse 112, stronger; less hemorrhage; feels weak, with slight headache; mind dull, but otherwise comfortable.

25th. 9 o'clock A. M. Pulse 100, improving; respirations 16 per minute; slept well during night; mind restored to its usual activity; lochial discharge more natural. Treatment continued. 1 o'clock P. M. Pulse 130, weaker; breathing normal; large œdematous swelling of labia minora; tongue sore and swollen from having been bitten during convulsions; no urine passed since operation. Consultation with Dr. M. V. B. Bogan. Oil of sweet almonds ordered for tongue. Two pints of urine drawn off by catheter. 8 o'clock P. M. Pulse 112; breathing natural; treatment continued.

26th. 9 o'clock A. M. Pulse 108, good; respiration normal; no urine voided; headache through the temples. Treatment continued. Also blister to back of neck; mustard to calves of legs, and hair cut short. 1 o'clock P. M. Pulse 136, feeble; considerable headache; one pint and a half of very dark coloured urine drawn off by catheter; after-pains with discharge of blood clots. Treatment continued; also sweet spirit nitre and spirit mindereri ordered, and cream for nourishment. 8 o'clock P. M. Pulse and respiration the same; skin hot and feverish; headache the same; lochia scanty with blood clots. Treatment continued.

27th. 9 o'clock A. M. Pulse 120, of better character; skin moist and comfortable; voice stronger; expression of countenance better. During the night had nine passages from the bowels, first two natural, the others thin and greenish from abundant secretion of bile, the probable effect of the mercurial ointment. Fever mixture stopped. Starch water and

laudanum enema ordered. 1 o'clock P. M. Pulse 116; consultation with Dr. Bogan; mercurial inunctions discontinued; patient begins to take nourishment. 10 o'clock P. M. Pulse 120; urine passes freely, is dark coloured and loaded with mucus; slight headache.

28th. 12 o'clock M. Pulse 112; urine still dark coloured and loaded with mucus. Fever mixture every three hours. 8 o'clock P. M. Pulse 108; headache disappeared; treatment continued, chicken broth ordered.

29th. 1 o'clock P. M. Pulse 100, good; stop fever mixture, reduce carb. ammon. to three times a day. Chicken broth, one pint in twenty-four hours.

30th. 1 o'clock P. M. Pulse 104, rather feeble; patient had four passages from bowels during night. Continued treatment, and add f3j offic. sol. of morphia.

31st. 1 o'clock P. M. Pulse 104, stronger; wandering pains in bowels. Continued treatment; mustard poultice over abdomen.

Feb. 1. Slightly salivated; tongue quite sore and swollen, so much so that only liquids can be swallowed, more, however, from the laceration received during the convulsions than from the effects of mercury.

From this time forward she continued to improve steadily, the condition of the mouth being the only troublesome symptom, until Feb. 12, when she was able to sit up a considerable portion of the day, and attendance was discontinued.

In the above reported case, the exciting cause of the attack was without doubt the reflex irritation from the pressure of the head upon the os uteri during dilatation, as indicated by the *sudden* subsidence of all symptoms upon the completion of the labour.

In the treatment it is of interest to notice that chloroform by inhalation produced no good effect whatever, although it was given a fair trial.

"Version" was resorted to as a forlorn hope, and the result shows in what desperate cases a favourable termination may sometimes be brought about. The condition was most unfavourable for performing the operation, the membranes had been ruptured, the head was engaged in the superior strait, and the uterus was firmly contracted around the body of the foetus. On this point Ramsbotham says, "Neither is the operation of turning under convulsions free from objections. It would be most unwise to attempt its performance if the head were engaged in the brim of the pelvis, if the membranes had been ruptured for any length of time, and the uterus were strongly contracted around the child's body; because of the difficulty we must encounter and the danger we must necessarily incur." Just the condition above described, yet what else could be done? The convulsed condition of the patient was constant, only remitting slightly at intervals; the pulse was almost imperceptible; the respiration was irregular and jerky, and we looked for each moment to terminate life.

1867. January 7. *Neuralgia followed by Paralysis of Motion.*—Dr. H. P. MIDDLETON read the following report of a case:—

On the 7th of May, 1865, I was called upon by Mr. R., of this city, to attend his wife. He informed me that labour pains had already commenced three or four hours before; that the patient was thirty years of age, then some three weeks over her time, and that she had been pregnant but once before, when she had miscarried at the third or fourth

month. The physician who attended her on that occasion—in the North—pronounced her pelvis *small*. Mr. R. had called upon me in consequence of the physician who had been engaged to attend her being absent from town. This latter gentleman, however, arrived at the house before me, and I consequently left the case in his hands. Three weeks later—June 5th, 1865—I was again requested to call and see Mrs. R., and received the following brief history of the case since my last visit. Mrs. R. had been delivered with forceps. In making traction, the accoucheur bent the instrument to such a degree as to be obliged to send for another pair to complete the delivery. The child was born dead, and the mother had been sick ever since with what the attending physician called “milk-leg.” I found her pale and emaciated; nervous and agitated; skin moist and rather cool; pulse one hundred, feeble; tongue dry, but clean. She complained of a dull, subacute headache, and intense pain in the right leg and thigh, extending from the hip to the ankle-joint; a constant pain, subject, however, to exacerbations and remissions, becoming very severe every afternoon about three or four o’clock, and abating somewhat towards morning. She was suffering from one of these paroxysms when I called. Upon examination, found the limb of normal temperature; no swelling; integument and muscles rather flabby. She almost screamed with pain when gentle pressure was made on the thigh, over the position of the anterior crural and great sciatic nerves (especially the latter), or down the leg, over the posterior tibial. The leg was slightly flexed upon the thigh; it could not be extended because of the excessive pain thus occasioned, and there seemed to be a tendency towards increase of the flexion. The muscles of the thigh twitched violently from time to time, causing an increase of the pain, as did also every attempt Mrs. R. made to move the limb. The patient informed me, with regard to her late confinement, that her pains had commenced about twelve o’clock P. M., and continued to increase until about nine o’clock A. M., when they first began to abate, then ceased entirely. The attending physician then gave her a powder, in half a tumblerful of water. The pains thereupon returned, but with less severity than before; and after making a digital examination, the doctor informed her that the child was dead, and proceeded to apply the forceps. The child was a very large one. After delivery she seemed to progress very well for five or six days, at the end of which time she began to experience a constantly recurring uneasy sensation extending down the thigh. For this she was ordered a liniment. The pain continued, became more severe from day to day, and soon extended from the hip to the ankle. The doctor then informed her that she was going to have a “milk-leg,” and ordered her to continue the application of the liniment; to have a *teaspoonful* of Dover’s powder every four hours, or as often as necessary to relieve pain and induce sound sleep; and to live upon toast, tea, etc., with a little animal broth for dinner. Her husband, knowing something of the composition of Dover’s powder, only gave her one-half the quantity prescribed, and found this to occasion great nausea, and sometimes considerable emesis. The physician being informed of this fact a few days later, ordered her to take *as much* of a teaspoonful of the powder *as she could* every night, and to take a teaspoonful of pulv. jalapæ, with two teaspoonfuls of cream of tartar, in a tumbler of water, three times daily, and to discontinue the animal broth. She followed his directions in regard to diet, but took the medicines in half the quantity prescribed. In

this dose, even, she found that the cathartic produced much griping and tenesmus. Finding that, instead of improving, all her ailments seemed to be more and more aggravated, her husband concluded to seek other advice; and, having dismissed the attending physician, called upon me to attend. It is needless to say that I failed to discover any indication for a continuance of the remedies prescribed, or any symptom indicative of crural phlebitis. I rather regarded the case to be, and to have been from the first, one of neuralgia, without regard to its origin or the cause of its continuance. At all events, I concluded to give the antiperiodic powers of quinia a trial in this case, and ordered pills of valerianate of quinia, to be commenced the next morning. In addition, I prescribed a chloroform liniment, and, as the patient had become habituated to a "night-cap" of Dover's powder, and was suffering great pain, I could not, of course, wholly withhold the opiate; but suspended the powder, substituting forty drops of liq. morph. bimeconatis, at night. Also ordered strong beef-tea and milk-punch.

June 4. Although much disturbed during the night, she had enjoyed more sleep than usual. She was then taking the quinia. On the morning of the 5th, Mrs. R. informed me that she had had a paroxysm on the previous afternoon, but of a greatly mitigated character. Remedies continued as before.

6th. The paroxysm due yesterday afternoon was completely missed; but the cessation of the pain in the leg has been followed by an almost complete loss of hearing, and by violent ringing noises in the head, which rendered the patient almost wild. I attributed this to the quinia, but never, either before or since, saw its effects in so marked a degree. I was obliged to suspend its use for two days. During this time the paroxysms returned, but with less severity. I now was satisfied with my diagnosis, and with Mrs. R.'s condition; believing that her neuralgia was kept up in great measure, if not wholly, by her anæmic and debilitated condition. I then ordered her some pills of quinia, Vallet's mass., ext. aconit. rad., alcohol, and pulv. lupulinæ, and directed her to have beef steak, beef-tea, milk-punch, etc. Under this treatment she began to convalesce, and slowly, but steadily improved; though she had one or two very slight relapses, and at one time was attacked with a diarrhœa, which lasted ten days, in spite of all efforts to arrest it. After this, however, she continued to improve more rapidly than she had done previously; she soon ceased to have the afternoon paroxysm, and the pain disappeared from the limb, except when she moved, it being even then much less severe than formerly. She seemed to be peculiarly susceptible to the influence of aconite; in two days her pulse sank to sixty beats per minute. I then withdrew the aconite and substituted ext. belladonnæ. The other medicines were continued, and my visits to the patient diminished in frequency until I only saw her about once a week. When I called on the 28th of July, Mrs. R. informed me that all pain had been dissipated, but that she could hardly move her limb at all, and that with great effort. Not laying much stress upon her statement, I simply advised her to use gentle friction over her limb, promising to call again in a few days. At my visit on the 5th of August I regretted to find a complete paralysis of motion of the thigh and leg. There was no sensitiveness over the spine. I withdrew the belladonna and lupulin from the pills, substituting ext. nucis vomicæ, in doses of one-third grain three times daily, subsequently increased to one-half grain, and then two-thirds grain three times daily.

Under this treatment the power of motion gradually returned; the patient rapidly regained colour and weight, and, by degrees, the desire (or necessity) for the opiate was overcome, and she slept soundly without it. Her appetite was excellent, and, when I ceased attendance upon the case, her health was evidently and fully restored.

January 26. Measles and Hooping-Cough coincident.—Dr. D. W. PRENTISS reported the following case:—

Mary J., aged 7 years, attacked with catarrh, May 1, 1866, out of which a paroxysmal cough gradually developed until May 20th, when the characteristic hoop was first heard. From this time the paroxysms continued to increase in frequency and severity, each one ending in a prolonged, loud hoop, up to the 3d of June, when there was an accession of fever, running at the nose, and red appearance of the eyes in addition to the previous symptoms.

June 6. Was called to the patient on account of the appearance of an eruption on the face, as well as high fever and difficulty of breathing. I then learned the above history of the case. Auscultation showed congestion of the lungs.

7th. Eruption had extended to shoulders and chest, and next day to the extremities. In ten days from first appearance, it had entirely disappeared. The affection was distinctly measles, to the contagion of which the child had been exposed.

During this time, the original disease, hooping-cough, continued with unabated violence, the cough recurring as often as half a dozen times during the night, and each time ending with the hoop.

The congestion of lungs referred to became complicated with pneumonia, which threatened for several days to destroy the patient's life, but finally yielded to a tedious convalescence. It was not until the early part of August that she could again be pronounced well. The treatment, which was directed only to the lung disease, consisted of perfect rest, expectorants, diaphoretics, and stimulating liniments.

Dr. Prentiss noticed two points of interest connected with the above case: 1st. That we have two epidemic and contagious diseases running their course apparently independent of each other, in the same patient at the same time. 2d. That in each of these diseases there is an especial tendency to serious affections of the lungs, in fact, three-fourths or more of the deaths from either are from this cause. Hence we would naturally expect in a complication of the two, that the danger from this cause would be increased twofold, and the sequel in this instance bears out the induction. Not only was the patient's life in jeopardy for some time from inflammation of the lungs, but she has had subsequently both pleuritis and bronchitis, and is still very susceptible to lung disease.

February 16. Strangulated Hernia of four days' standing relieved spontaneously.—Dr. J. F. THOMPSON reported the following case:—

A man of fine physical development, about 30 years of age, was admitted to Providence Hospital, February 1st, with a large, congenital, scrotal hernia of the right side which had become strangulated. It had been down several times during his life, as large as on the present occasion, but he had always before succeeded in reducing it himself without difficulty. Three days previous to his admission, in jumping from a carriage he felt the intestine pass into the scrotum, but had been unable to

return it. That night the ordinary symptoms of strangulation came on, and vomiting continued up to the time of his being sent to hospital. Efforts were made the next day after the accident by Drs. Wm. Lee and D. R. Hagner to reduce by taxis, but without success.

First saw him, Feb. 2, at 10 o'clock, when he was in considerable distress, but not in as bad a condition as might be expected after a strangulation of so long standing. There had been no vomiting since early in the morning, but he had taken nothing to eat or drink.

The tumour was large, hard, and almost perfectly round; bowels not moved since the accident; pulse excited but quite strong. Ether was administered and taxis tried faithfully for full half an hour without success. Efforts were made also by Drs. C. M. Ford and W. B. Drinkard with same result. The propriety of an operation was discussed, and it was decided to wait for more urgent symptoms. Ice was ordered locally, and one-third of a grain of morphia to be taken every three hours. 5 o'clock P. M., continued much the same as in morning, rather more comfortable, treatment continued, and enema ordered. The enema operated about 7 o'clock, and shortly after the bowel returned into the abdomen with a gurgling sound.

Approaching the hospital the next morning about 11 o'clock, I was somewhat surprised to meet the patient returning home with a brisk walk.

The very unexpected termination of this case renders it one of great interest. The preponderance of written authority would hardly justify the postponement of the operation when strangulation had already existed three days, but there are able teachers who would have approved the delay under the circumstances.

The reasons for not operating were, that the hernia was congenital; that at the time the neck of the tumour was quite large; and that the symptoms were not very distressing. If the constriction had been very great, his condition, after three days, would certainly have been more serious; the circulation, however, was not entirely interrupted.

March 2. Twin Pregnancy and Double Abortion, with Secondary Hemorrhage.—Dr. J. T. YOUNG reported the following case:—

About 5 o'clock A. M., March 1st, 1865, was called to visit Mrs. S., who was represented to be in great pain, but not pregnant. Found her sitting upright in bed, suffering from severe periodical pain in the lower part of the abdomen, which was enlarged and containing a tumour evidently uterine, due, as she stated, to dropsy of two or three months' duration. Three months previously she had had an abortion of a three-months foetus; after which the abdomen did not regain its normal condition, but, on the contrary, had gone on increasing in size until the time of this attack. Auscultation of the tumour discovered the existence of a foetal heart, and vaginal examination revealed the os uteri dilated to an inch in diameter, and a foetal head of six months' development pressing upon it. At 4 o'clock P. M., a living foetus of six months was delivered. Severe hemorrhage followed, which was checked by ice, and the placenta proving to be adherent was detached in pieces. The flooding continued to recur at intervals up to the eighth day, when a very severe hemorrhage occurred, which nearly terminated the patient's life. However, by raising the pelvis, pressing upon the abdominal aorta, and the free use of ice, it was checked; but not until the patient had fainted. Forty minims of laudanum were then administered, followed by small doses of whiskey, frequently repeated, until she rallied. The amount of blood lost was so

great that it was necessary to keep the pelvis and extremities elevated to prevent syncope. Convalescence set in without further difficulty, and progressed favourably to health.

March 16. Hypertrophied Inguinal Glands, with Varicose Lymphatics, Simulating Hernia.—Dr. W. B. DRINKARD stated :—

The accompanying specimen was removed from a middle-aged negro man (cause of death unknown) lately brought into the dissecting-room of the National Medical College. On my attention being called to the subject, I at once corroborated the statement that had been made to me, viz., that he was the bearer of a femoral hernia; although, while making the assertion very positively, I yet admitted that the case presented some peculiarities. The hernial tumour, as I supposed, occupied nearly all the superior part of the groin, being situated rather more to its outer than its inner side (one circumstance which had excited in my mind doubts as to its hernial nature); its upper boundary slightly overlapping Poupart's ligament; obscurely ovoid in shape; about four inches in its long diameter, by three or three and a half inches in its short or vertical diameter; rather "baggy" in appearance, the skin being not tense but loose and somewhat sacculated towards the inner and inferior portion, the only spot in which there was any discoloration: here the integument was slightly paler than over the rest of the tumour. (The subject, it must be borne in mind, was a negro, of very dark hue.) To the feel, the tumour was soft, doughy, inelastic, its contents yielding readily to pressure, but returning slowly to their former position when the pressure was removed. The fingers, in their exploration of the tumour, could distinguish certain portions which were more compact and consistent than the rest, although their exact outline was not easily definable amid the soft mass in which they were situated. This I took to be an indication of the presence in the sac of omentum, another exceptional trait for femoral hernia. The slight efforts that I made to replace the contents of the sac in the abdomen were ineffectual, although there had been evidently no strangulation of the hernia, and I could easily pass my fingers under the falciform edge of the fascia lata, over which the inner border of the tumour extended. The situation of this tumour, then—its apparent connection with a patent condition of the saphenous opening, and the characteristic feeling imparted on palpation—induced me to consider it as an example of femoral hernia, despite its peculiarities antagonistic to this view, and the absence of those symptoms that might be observable during life;—a hernia, I thought, either still consisting of intestine or, more probably, constituted by a portion of omentum contained in an old and, perhaps, obliterated sac.

This opinion as to the nature of the tumour was, however, soon removed on dissection, which exposed a thickened superficial fascia, from the meshes of both of whose layers protruded the cellulo-adipose tissue of the region. On removal, the tumour presented no connection with either the crural or the inguinal ring. Its appearance was that of a mass of cellulo-adipose tissue, interspersed with lymphatic glands evidently undergoing fatty degeneration, and presenting here and there, over its dissected surface and through its substance, patches of a pale rose colour, resembling cellular tissue infiltrated with the serum of the blood, and bearing in some points a yet closer resemblance to fresh muscular tissue. Although the exact nature of this tumour has not been completely eluci-

dated by the dissection, yet the opinion which seems to me the only tenable one in the premises, is that it was formed by an hypertrophy and fatty degeneration of the inguinal glands, with, probably, a varicose condition of the lymphatics immediately connected with them. This condition of the lymphatic vessels, though rare, has yet been observed by several surgeons and pathologists; instances of it are adduced by Breschet, Cruveilhier, A. Cooper, Sæmmering, Amussat, Demarquay, Andral, and Nélaton. In one case Amussat found a tumour of this nature occupying each inguinal region, and in which the development of the inguinal lymphatics had extended to the glands, with the effect, apparently, of transforming these latter into a congeries of vessels. During life the patient had worn a bandage, these tumours having been mistaken for a case of double hernia.¹ But none of the works to which I have had access, and which treat of the subject, give any precise indications for the diagnosis of the tumours thus formed, nor describe their pathological anatomy. I have, however, met with a case belonging to this class. The following extracts from the notes which, fortunately, I made at the time of seeing it will serve to point out the decided similarities between it and the case just presented. (I am not aware that this case has ever been in print; otherwise I would content myself with a simple reference to it.) The patient was in the service of M. Nélaton (Hôpital des Cliniques, Paris) in 1863—a young man of 26; good muscular development and apparently perfect health. For a long time a tumour existed in the left groin, which the patient knew to be the testicle. Latterly, another tumour has been added to the one already existing in this region. The tumour, as now constituted, is situated upon the outer two-thirds of Poupart's ligament, and invested by sound integument. The testicle can be distinguished as a mass harder than the rest. In his clinical remarks on the case M. Nélaton said:—

"The first idea given by the tumour is that it is formed by the testicle, which has become deviated in front of the abdominal aponeurosis, and that a hernia has followed the testicle—an omental hernia which would give to the tumour the peculiar sensation experienced on palpation. However, there is some difficulty in accepting the explanation. . . . Moreover, with regard to the idea of an omental hernia, there is no pedicle traversing the inguinal canal; the idea, then, is done away with. . . . I have thought, also, that this was probably an example of an excessively rare tumour—of which I have seen only three cases: tumour formed in the inguinal region by the abnormal development of the inguinal glands. I can recall a case similar to this one: that of a young man who was the bearer of an exactly analogous tumour in the groin."

M. Nélaton distinguishes these tumours formed by glandular hypertrophy from those varicose lymphatics which, on incision, exude a limpid lymph; the tumours in question giving issue to a milky or rose-coloured lymph. In the specimen that I have presented, I think that there is a co-existence of the two conditions. No operation was undertaken upon the tumour described above. I have among my notes the records of another case—observed in the wards of the same surgeon—in which there was not simply hypertrophy of the lymphatic glands, but also a *melanic degeneration*, occupying both inguinal regions, and descending into the pelvis. The external characters of the tumours thus formed were much the same as those of the case just described. The course of the lymphatic vessels

¹ Breschet. "Le Système lymphatique considéré dans les Rapports anatomique, physiologique et pathologique." p. 260.

of the limb, leading to the tumour, however, was marked by bluish-black lines, which gave to the limb a marbled aspect. There had been besides a manifestation of general accidents, nausea, vomiting, and defective digestion. Of course, I recalled this case simply as an instance of glandular tumours in this region, not as a parallel to the specimen that I present. (It is a singular coincidence, I may remark in leaving these cases, that in all the instances of this kind in which I have found the precise location of the tumour designated, it was in the *left* inguinal region. In the woman who presented melanic degeneration of the inguinal glands, the affection also commenced on the *left* side.)

The situation and peculiar "feel" of the tumours in the two first-mentioned cases; their likeness to hernial tumours; with the exudation, on incision, of a rose-coloured liquid in the second case, present analogies with this case of mine that cannot be overlooked. At the same time, in the absence of a mercurial injection, or of a more minute examination of the tissues than I was able to give them at the time of removal, the diagnosis even now is of course somewhat hypothetical. The point of *practical* interest in this case is the diagnosis of the tumour from a hernia. While the *post-mortem* error is evidently of easy commission, yet I think that, during life, the absence of any impulse on coughing or straining, the invariable size of the tumour, and the history of the case, would suffice (particularly if the surgeon were on his guard, and forewarned of this occasional complication) to prevent the occurrence of a mistake that might lead to fatal operative procedures in case of the supervention of symptoms denoting strangulation.

March 30. Cerebral Congestion Successfully Treated by Venesection.—

Dr. A. F. A. King reported the two following cases:—

CASE. I. On the 16th June, 1865, Mr. J. P., aged 25, a clerk in one of the Departments, had taken an unusual amount of exercise by walking in a bright sun during the heat of the day, without any shade or protection from the solar rays. During the latter part of the day he was attacked with slight headache, which continued through the night, preventing sleep, and which became greatly increased in intensity about 2 A. M. on the following morning, and from that time continued unabated until 3 P. M. of June 17, when I visited him, being about twenty-four hours after the first pain was experienced.

At that time his condition was as follows: Headache intense; skin hot, though not excessively so; pulse full and hard, and but little increased in frequency. His bowels were constipated; tongue coated with a white fur, and he had vomited, though the stomach was now quiet. Very restless on account of the intense headache. Slight intolerance of light and sound, though of these the patient did not complain until questioned in regard to them, his whole attention being engrossed by the cephalalgic pain. Upon examination of the eye, the right pupil was found widely dilated and insensible to light; the left one natural. Sensation, intelligence, and motion, *undisturbed*.

The patient was now placed in a sitting posture, and a full half-pint of blood taken from the arm. Being rather timid of bloodletting, the bleeding was for a moment arrested, until its effects could be ascertained. Pulse became softer, but by no means weak; as yet there was no perceptible pallor, nausea, or faintness. The patient, on shaking his head, pronounced it already decidedly better. Pressure was then removed and

the bleeding continued ; but a few additional ounces of blood had escaped before the patient suddenly fainted, but with proper means rallied in a few minutes. R.—Hydr. chlor. mit. gr. v, pulv. jalapæ gr. xv, extr. colocynth. gr. v.—M. Take at once.

18th. Eighteen hours after bleeding. Pulse natural. No return of headache since venesection, immediately after which it was entirely and *permanently* relieved. The purgative operated freely and the patient had slept. The pupil of right eye still dilated and immovable.

19th. No further medication necessary. Appetite good. Resumed his business.

In commenting on this case, I have only to remark that the excruciating headache was almost instantaneously relieved by bleeding, and did not in any degree return. While the disease was thus apparently cut short by the bleeding, it may be a question of no little gravity and practical interest, to consider what might have been the result in case venesection had been omitted.

In explanation of the dilated pupil which remained after the cerebral symptoms had been removed, and was not at all influenced by them, it was found that the eye was affected with mydriasis, for which, by the by, a course of treatment, principally by the application of extract of Calabar bean, had been employed without benefit. Up to the present time (July, 1868) the mydriasis remains, changing occasionally from one eye to the other.

CASE II. J. B., mechanic, aged 25, a strong, thick-necked muscular man. He has generally been healthy, with the exception of constipation, which has inconvenienced him more or less for the last five years.

February 2. Felt slightly unwell, but continued work until 4 P. M., when he ate heartily for dinner of pork and beans—his usual diet. In the act of chopping wood after dinner, he was taken with “a weakness,” and fell to the ground. On being carried to the house, he was attacked with violent vomiting, which continued incessantly (the simplest diluents being immediately rejected), and he suffered from intense headache. Visited him at 7 P. M. In addition to the above symptoms, his tongue was coated, pulse 80 and tolerably full, but not hard. No heat of skin or flushing of face. Eyes natural. Bowels constipated. Motion, sensation, and intelligence unimpaired. Sinapisms were applied to the leg, calves, and epigastrium, by which the pain seemed to be temporarily mitigated, but it was at no time entirely relieved. R.—Pil. hydrag. gr. x, resinæ podophyllin gr. ss.—M. Take at once. Ordered rest and quiet, with cold water and ice when desired.

3d. Did not see him till 3 P. M., when I was sent for, as the patient was worse. There had been no alvine evacuation, and the vomiting, though it had once moderated, was now as violent as at first. Headache intense ; the patient rolling about the bed and groaning with agony. An enema of soapsuds, castor oil, and spts. terebinthinæ was administered, and produced a plentiful discharge in a few minutes. His pulse was now 78, and full as before. Respirations silent and slow, with an occasional deep-drawn sigh. Ordered full dose of magnes. sulph. Cold constantly to head and hot foot-bath containing mustard and capsicum.

4th. No alvine operation, though the salts were retained for some time after being taken. Headache intense, and he is again vomiting. Pupils natural, but the upper lids droop, and light is unpleasant. The skin is cool, and, what is remarkable, the pulse from being 78, now numbers but

40 per minute—it is full and slow, but not tense. Respiration also very slow, with an occasional deep sigh. R.—Hydr. chlor. mit. gr. x, resinæ podophylli gr. j. To be taken immediately, and followed in four hours by ʒjss castor oil. 3. P. M. Symptoms unchanged. No operation, though the medicine, including the oil, has been retained some hours. I now determined to try the effect of bloodletting, resolved, however, to proceed more cautiously than in the previous case. Accordingly, the patient sitting, a small opening was made in the vein, and not more than ʒiv of blood had been taken before the pulse rose to 50, and the patient expressed himself as being in some measure relieved of the headache. Vomiting now came on and the bleeding was stopped. As he lay down, a rumbling was heard in the bowels, and there was an immediate desire to have an operation, though this soon subsided without the wished-for result. The castor oil, previously taken, was now rejected. R.—Ol. tiglii m.j, ol. caryophylli m.j, mica panis q. s. ft. pil. j. To be taken immediately. To repeat pediluvia of mustard, and place blister to nape of neck.

5th. Patient up and received me at the door. The croton oil pill was rejected after remaining in the stomach two hours. He has, however, had three free operations; pulse 72. Headache gone, though there remains a feeling of soreness within the cranium. Countenance cheerful, but the upper lids are drooping; tongue clean and moist; respirations have regained their frequency. Advised rest, abstinence from stimulating food and drink, together with suitable measures to overcome the chronic constipation to which the patient had been subject.

On the following day, at 1 P. M., I was again sent for. Contrary to orders, the man had gone to work and eaten heartily of beef-steak and potatoes. After this the headache began to return, and the patient had walked to the druggist and obtained another of the croton oil pills, which he immediately took. Upon my arrival the pill had already operated freely; the headache, however, was still extremely violent, the patient rolling about in bed suffering painfully. He described it as a deep-seated pain, occupying the whole of the interior of the cranium. The vomiting was incessant, and there were annoying eructations of wind, and a greenish watery liquid. The pulse had again become *infrequent*, and in a marked degree, irregular, counting, during four successive half-minutes, respectively, 39, 27, 37 and 29, being from 60 to 66 for the whole minute. Respiratory acts almost imperceptible to the eye and ear, with occasional deep sighs; slight photophobia, and sounds are annoying to a limited extent; countenance languid, and the veins of the forehead are distended and easily recognizable at some distance from the patient. As the symptoms thus presented themselves—the headache, vomiting, turgescence of the superficial veins, together with the oppressed respiration and circulation, all indicating oppression of the encephalon—and as no benefit had been obtained by the free purgation of the last croton oil pill, the question of bleeding again presented itself. At this point, in calling to mind the manner in which venesection has lately been decried by high professional authority, I felt by no means confident that venesection was a legitimate remedy in the case before me; at the same time I felt assured that if the head pain depended upon the plethora of the encephalic vessels, bloodletting would as surely be followed by relief, as it was on the two previous occasions already referred to. To ascertain this point, I resolved upon the following experiment: A bandage was applied tight around each arm near the axilla, and one in like manner round the upper part of each

thigh. Blood was thus made to collect in the extremities, and the whole amount circulating through the cranium was as effectually diminished as if a portion had been extracted by venesection. To my satisfaction the pain was ameliorated by the ligatures. After the limbs had been tied a few minutes, the patient remarked that he "*thought*" he was better, and in a minute or two more became "*pretty sure*" of it, though the pain was still bad. At any rate, it was noticed that after the bandages were applied, the patient stopped rolling about, and became more quiet and contented; and when they were loosened, which was purposely done, as suddenly as possible, he at once turned over, and *of his own accord* cried out with a profane exclamation, that the pain had returned with its former severity. After a lapse of a few minutes he assured me of his *certainly* that the headache had been mitigated by the ligatures. I considered this, therefore, an indication to draw blood, and accordingly a small bleeding of 3vj was performed. The patient immediately became more quiet, and confessed himself partly relieved of the pain. The pulse, though somewhat increased in frequency, still performed its beats with considerable reluctance. It was now ordered to shave the head and apply a blister to the scalp. Also bromide of potassium in ʒj doses every three hours.¹ Sinapisms to the feet and legs.

At this interesting period of the case the patient was removed to his own home, in a distant part of the city, where he was attended by a physician in the neighbourhood, and I lost sight of him. I have since learned the attack lasted about a week after his departure, and that he finally recovered and is now enjoying good health. It is gratifying to know the patient got well at *last*, and we cannot but suppose he would have done so *at first* if a full bleeding had been performed, as it had been, and with such a good result, in case number one.

June 1. Mitral Disease of the Heart, with Autopsy.—Dr. J. FORD THOMPSON presented a heart with calcareous deposit in and around the mitral valves, and the following report of the autopsy:—

On the 23d of April, at the request of Dr. Thos. Miller, I made an autopsy on the body of a man who had died the day before. Disease of the heart had been diagnosed, and the chest was first opened. The pericardium was greatly distended, and occupied a much larger space anteriorly than natural. I noticed at the same time that the right pleural cavity was filled with serum containing pus; there was a smaller quantity in the left pleura. On opening the pericardium about eight ounces of serum escaped. The heart was much enlarged, more from dilatation than from hypertrophy. It weighed one pound and two drachms. The serous membrane was not inflamed, and no lymph was found in it. The auricles and ventricles were much dilated, particularly the left auricle, which was large enough to hold six or eight ounces of the fluid. The muscular tissue of the organ did not seem to be hypertrophied, but there was general enlargement with dilatation. The valves were all found healthy except the mitral, in and around which there was an extensive deposit of calcareous matter, which extended nearly around the fibrous ring, so that it was impossible to close the orifice.

The fluid in the right pleural cavity measured about half a gallon; it was milky in appearance, and contained flakes of lymph. The left cavity contained about a pint of the same fluid. The lower lobe of the right lung

¹ In conformity with Dr. Hammond's views, that this medicine lessens the amount of blood circulating within the cranium.

was hepatized, as was the lower lobe of the left lung. The superior lobes were healthy. The examination was not extended further.

This man was about 27 years of age, and had had several attacks of acute rheumatism during his minority. The date of these attacks I could not ascertain. He was first seen in this city by Dr. J. W. Bulkley about six weeks before death. He complained of shortness of breath, and pains about the præcordia. The chest was carefully examined by the doctor, and the diagnosis made was pericarditis with effusion. Three days later Dr. D. R. Hagner saw the patient in consultation, and he agreed with Dr. Bulkley that there was effusion in the pericardium. The sounds of the heart were so confused and indistinct that they were unable to form an opinion in regard to the condition of the valves. About two weeks later Dr. Miller was called in consultation who confirmed the diagnosis, and also expressed the opinion that there was mitral disease. Neither Drs. Bulkley or Miller, who were at the examination, seemed to expect that effusion would be found in the pleural cavity.

Dr. Hagner afterwards informed me that he had detected fluid in both pleural cavities a few days before death, and was of opinion that the effusion was quite recent. It is remarkable that there was no anasarca in this case when we consider the extent and duration of the disease. The treatment was conducted on general principles.

Poisoning by Castor Oil Beans.—After the discussion on the above case was closed, Dr. Wm. Lee reported a case, under his observation, of a child who had swallowed several castor oil beans, and catharsis and emesis resulted to such an extent, that the term *poisoning* might not inappropriately be applied. Under stimulant treatment the child recovered.

REVIEWS.

ART. XIV.—*Pulmonary Phthisis.*

1. *Felix, Von Niemeyer's Clinical Lectures on Pulmonary Phthisis.* Translated by J. L. PARKE. pp. 116. 12mo. Moorhead, Simpson & Bond, New York, 1868.
2. *On the True First Stage of Consumption.* By HORACE DOBELL, M. D. pp. 75. 12mo. John Churchill & Sons, London, 1867.
3. *On the Nature, Cause, and Treatment of Tuberculosis.* By HORACE DOBELL, M. D. pp. 84. 12mo. J. Churchill & Sons, London, 1866.
4. *On the Use of Perchloride of Iron and other Chalybeate Salts in the Treatment of Consumption.* By JAMES JONES, M. D. pp. 109. 12mo. John Churchill, London, 1862.
5. *On Consumption and its Treatment by the Hypophosphites.* By JOHN C. THOROWGOOD, M. D. 8vo. pp. 47. John Churchill & Sons, London, 1868.
6. *On the Treatment of Pulmonary Consumption by Hygiene, Climate, and Medicine.* By J. HENRY BENNET, M. D. 8vo. pp. 56. John Churchill & Sons, London, 1866.
7. *Egypt and the Nile, considered as a Winter Resort for Pulmonary and other Invalids.* By JOHN PATTERSON, M. D., L. R. C. S. 12mo. pp. 84. John Churchill & Sons, London, 1867.
8. *Change of Air, considered with regard to Atmospheric Pressure and its Electric and Magnetic Concomitants, in the Treatment of Consumption and Chronic Disease.* By J. C. ATKINSON, M. D. pp. 142. 12mo. Trübner & Co., London, 1867.
9. *Phthisis and the Stethoscope ; or, the Physical Signs of Consumption.* By RICHARD PAYNE COTTON, M. D. pp. 104. 12mo. John Churchill & Sons, London, 1868.

THERE is no disease, perhaps, which is so full of interest to medical investigators as phthisis, and this is true in reference as well to its pathology as to its therapeutics. Of the books which head this paper, that of Dr. Niemeyer treats especially of the pathology of the disease ; while the other authors, with the exception of Dr. Cotton, have occupied themselves more particularly with its therapeutics and with the influence that climate has upon it. As the views which Niemeyer publishes in his book may be new to many of our readers, a short abstract of them may not be out of place. To some extent these opinions have been anticipated by recent publications of Virchow, and they therefore cannot be looked upon as entirely original with Niemeyer.

Niemeyer begins his book by regretting that clinical medicine has not kept pace with the advance made by pathological anatomy during the past few years. This he ascribes in part to the impression left upon the medical mind by Laennec, by whom all cases of consumption were referred to the deposit of a new product called tubercle (*une espèce de production accidentelle*), and to the subsequent changes which this product underwent. It is now known, he says, that many of the lesions

which are generally attributed to tubercle are really the consequence of pneumonia, either acute or chronic, or of a bronchial hemorrhage: and no form of pneumonia is so likely to be followed by phthisis as that characterized by the excessive production of cells, and called by Niemeyer catarrhal pneumonia, to distinguish it from the ordinary, or, as he calls it, croupal pneumonia. Although phthisis generally takes its origin from the former form, it occasionally arises from the latter, and it is important to bear this in mind. The product of the inflammation undergoes what is known as the caseous degeneration, and hence gives rise to the caseous masses in the lungs which are generally mistaken for softened tubercle. Virchow has proved, however, that these caseous masses are sometimes entirely independent of a previous pneumonia, and are really either degenerated cancerous nodules or lymphatic glands swollen by a hyperplasia of cells. As a consequence of his investigations of phthisical lungs, Dr. Niemeyer makes the startling announcement that frequently in the lungs of those who have been pronounced phthisical, not a single tubercle is to be found. The disease of the lungs characterized by this caseous degeneration is called by him phthisis, to distinguish it from that in which a deposit takes place, and which he calls tuberculosis. But while he asserts that phthisis may and frequently does run its course without the development of tubercle, it is nevertheless true that the former predisposes to the latter, not as taught by Buhl through an infection of the blood, but probably—as it is generally in the neighbourhood of the caseous masses that the deposit is found—through the agency of the lymphatics; and in conclusion he says there is no worse evil that can happen to a phthisical patient than to become tubercular. It may generally be surmised that a phthisical patient is becoming tubercular, whenever an increase of fever, dyspnoea, and other symptoms take place without a commensurate increase in the gravity of the physical signs occurring at the same time. The caseous masses he thinks give rise to cavities in consequence of the pressure made by the large number of cells upon the nutrient vessels of the air sacs, in which way a process of slow mortification is brought about. Of course the length of time consolidation of the lungs may continue without this process taking place, depends very much upon the extent to which the proliferation of cells has been carried, and the amount of lung involved. In some cases, therefore, the pneumonic affection may continue without any cavities resulting; or if the proliferation of cells has been moderate, the organic part of the exudation may be absorbed, and nothing but the calcareous part left, which, by becoming encapsuled from the formation of connective tissue, may be rendered harmless; in still other cases it is possible that all the exudation may be absorbed, and nothing but dilated bronchi left as a consequence of the former disease. These bronchiectatic cavities are generally mistaken for those due to the softening of tuberculous matter, but care will generally enable us to distinguish one from the other variety. The cavities which result from the softening and elimination of the products of catarrhal pneumonia do not, our author thinks, exhibit the great indisposition to heal which is generally attributed to them.

In a few cases Dr. Niemeyer is forced to admit that tubercles are formed in lungs, in which no caseous masses are at all demonstrable, but he says that in these cases diligent search will generally show them to exist in some other parts of the body. He therefore announces the following theory: "Tuberculosis, in most cases, is a secondary disease,

arising in a manner not known to us through the influence of caseous morbid products on the organism." For the same reason, he considers that what is generally known as intestinal phthisis, is really not tubercular, but scrofulous in character, and analogous to affections of the lymphatic glands which begin with a hyperplasia of cells and end in ulceration. The true tubercular disease of the intestines very frequently associates itself with this latter, and is distinguished by the presence of gray granulations on the peritoneal coat.

Dr. Niemeyer also controverts the opinion that tuberculosis is an inherited disease, for he says children cannot possibly inherit a disease unless one or other parent was affected with it at the time of their conception, and, moreover, he does not think it proved that even the predisposition to tuberculosis is transmitted. On the other hand, he admits that a predisposition to phthisis is often inherited, and this predisposition is frequently made known by an excessive "vulnerability," which shows itself in a great liability to take cold, and to inflammations in which there is an abnormal production of cellular elements.

In a child, in whom this vulnerability has already shown itself, or in whom there is good reason to believe that it exists, everything which is likely to give rise to a serious effect upon the constitution should be avoided, even vaccination had better be postponed, as on more than one occasion Dr. Niemeyer has seen the febrile movement to which it gives rise followed by phthisis. From this circumstance he traces the mischievous theory that vaccinia may, and often does, give rise to scrofula. In many persons, this vulnerability shows itself in their appearance, but it often exists in individuals apparently robust, and the fact that it exists in any one should outweigh any impression derived from his appearance.

Another fallacy Dr. Niemeyer believes to be the impression that phthisis never begins from a neglected cold, and this delusion he thinks liable to lead to very great errors of practice; as in consequence of it patients are very often induced to neglect treatment at a time when it can be made most effective. He thinks also that it is entirely at variance with the experience of every practising physician, by whom it is perfectly well known that phthisis frequently dates from an exposure to cold or to any cause which produces hyperæmia of the lungs, or catarrhal affections of the bronchial tubes; and this hyperæmia may be caused by immoderate exercise, direct irritation of the lungs or bronchial mucous membrane by foreign bodies, or by the coagulated blood which has remained behind in the bronchi and air-cells after a hæmoptysis.

In regard to the relation which hemorrhage bears to phthisis, Dr. Niemeyer thinks that the views at present held are incorrect. Since the days of Laennec, spitting of blood has been looked upon as a result of phthisis, but before his time, it was perfectly well known that hemorrhage might precede the outbreak of the disease. The author thinks, moreover, that it may frequently be the exciting cause of phthisis in the following way: the blood remaining in the bronchi and air-sacs gives rise to a pneumonia, the products of which undergo caseous degeneration, and Dr. Niemeyer asserts that frequently after a hemorrhage, an increased temperature and the other evidences of a fever may be noted; and that sometimes the presence of crepitation may be detected by auscultation. We learn from him that hemorrhage, 1st, may occur in those who are neither phthisical at the time, nor later became so. 2d. Hemorrhage may also be caused by the same diathesis that causes the phthisis, but stand

in no genetical relation to it. 3d. Hemorrhage may precede the development, and stand in a genetical relation to such development. 4th. Hemorrhage may be developed in the course of phthisis. 5th. Hemorrhage may hasten the fatal termination.

In speaking of the symptomatology of the two affections, Dr. Niemeyer says that phthisis may be present without its existence being made known by excessive dyspnœa, and that this is most likely to be a distressing symptom in tuberculosis. The absence of dyspnœa in phthisis is especially marked whenever the patient is at rest, or whenever the extent of lung involved is small. On the other hand, the pressure of the granulations upon the bronchial tubes makes dyspnœa a prominent symptom in tuberculosis. Pains in the breast and shoulders are rarely absent during the course of either disease, but more frequently in the tubercular than the pneumonic form. It is a matter of some importance to decide whether the cough and expectoration have preceded the emaciation and other symptoms, or whether all the symptoms have appeared simultaneously. In the former case it is most probable that we have to do with a pneumonic process, in the latter with a tubercular. A harassing cough, with a scanty expectoration, indicates a more serious disease than a cough accompanied with abundant sputa which contain a large number of cells. "For," he says, "we can boldly assert that a patient who, in connection with other symptoms of pulmonary phthisis, expectorates sputa from whose character we can infer the existence of extensive destruction of the lung, is often in less danger than a patient who is feverish, pale, and thin, and expectorates only tough, transparent sputa." It has often happened to Dr. Niemeyer, as doubtless to other physicians, to bring about marked improvement in the first class of patients; but in the second, treatment is of no avail.

Fever is, of course, present in both forms; but there is this marked difference between the two forms, as regards fever: that in the pneumonic form there is a morning remission and an evening exacerbation; while, on the other hand, in the tubercular form, the fever is continued. While, therefore, a diminution of the fever indicates a retrogression of the disease; a tendency, on the other hand, to assume the continued form, indicates that the phthisis has become complicated with the more serious disease. Emaciation, impoverishment of the blood, and other symptoms of this class, belong to both forms, and will generally be found to bear some relation to the degree and amount of febrile action.

Dr. Niemeyer says that the physical signs soonest noted are dependent upon the swelling of the bronchial mucous membrane, and the secretion into the tubes, and of course are valuable as indicating phthisis just in proportion as they are limited to one apex. It is not absolute dulness, so much as a dull tympanitic tone, that should create alarm; for the latter indicates tuberculosis. The sinking in of the infra-clavicular spaces is regarded as due to the contraction caused by the caseous degeneration, and the diminished respiratory movements are of course due to the obliteration of the air cells by the caseous masses.

Treatment is attended with most success when directed against the pneumonic form, and least so in those rare cases in which the tuberculosis is uncomplicated; but treatment should begin long before the outbreak of the disease with those persons in whom we have good reason for thinking a vulnerability exists, and Dr. Niemeyer thinks we shall be more successful in impressing upon mothers the necessity for protecting their

children from injurious influences if we are able to tell them that it is not phthisis itself which they have inherited, but simply the predisposition to it, and that the disease itself may be warded off by a due attention to the laws of hygiene. Nothing will more effectually strengthen the constitution and keep this vulnerability in check than exercise in the open air so taken that all unnecessary exposure is avoided. The liability of children in orphans' asylums to scrofula is not so much owing to the kind of food which they eat—which is generally much better than that used by the poorer classes at their own homes—as to the deficient ventilation of these establishments. When the patient is actually suffering from an outbreak of the disease, in other words, when we are fully satisfied that the catarrh has invaded the air sacs, energetic measures should at once be adopted, and we are told to confine such patients to their beds, to cover their chests with cataplasms, and even in some cases to take blood by leeches or cups from their chest, and to repeat this treatment whenever an exacerbation occurs in the course of chronic phthisis. If the treatment above recommended be unsuccessful in arresting the fever, we should then have recourse to some one of the antipyretic remedies. Dr. Niemeyer has found particularly useful a pill composed of sulphate of quinia, gr. j; digitalis, gr. $\frac{1}{2}$; and opium, gr. $\frac{1}{4}$; repeated four times daily. In regard to the diet which should be allowed to a patient with phthisis, Dr. Niemeyer says, that as his body is being consumed by the fever it is only natural that he should require a large amount of nutriment, and of this nutriment a large amount must be composed of hydro-carbonaceous materials. In this way it is that cod-liver oil, cream, and other oily substances do good. Where cod-liver oil disagrees, the extract of malt may be substituted, and in some cases the grape cure will be found useful.

There are some points in this theory of the nature of phthisis that are exceedingly unsatisfactory, and among these none are more so than the fact that we are furnished with no means, microscopic or other, of distinguishing the gray, or, at all events, the yellow granulations from the caseous masses, Dr. Niemeyer himself admitting that the microscopic appearances are the same. Nor can we regard the two diseases as so entirely distinct as he would have us believe, and it is strange that he should hold this opinion, for he not only says that caseous degeneration of the lungs predisposes to tuberculosis, but that the gray granulations—and this, we think, will not be admitted by all—are never formed in the bodies of those who do not present some evidence of caseous degeneration, either in the lungs or elsewhere. The distinction between infiltrated and miliary tuberculosis has long been made, and we are not sure that our author's view is much in advance of those previously held. Nor are we disposed to admit that phthisis is always the result of an inflammation: although admitting freely that the first outbreak of the disease may frequently be dated from the exposure to noxious influences, cases will occur to the memory of every one where no such origin can be recognized. What will be said of those cases which undeniably follow long-continued grief, or some other depressing emotion? Besides which phthisis is a disease in which there are symptoms of general derangement, and any attempt to limit it entirely to lesions of the lungs must fail. The earliest symptoms, as is well known, are not always manifestations of lung trouble. Thus, in many cases, the patients appear to suffer from dyspepsia long before attention is directed to the lungs. Dr. Walshe evidently holds this view, for he mentions it as a characteristic of phthisis that the cough generally begins without catarrh.

In regard to the difference between the signs and symptoms of the two forms of disease, much is undoubtedly due to the fact that in one case softening has taken place and that in the other it has not. From observation of some cases of acute miliary tuberculosis we can, of course, indorse the statement that dyspnœa in such cases is extreme, although on the other hand some of the most distressing cases of dyspnœa that we have witnessed have been cases of infiltrated tuberculosis. We think it highly probable that hemorrhage may occur frequently, independently of the tubercular diathesis; but in the immense majority of cases it undoubtedly shows a certain amount of *vulnerability* in the individual, even if it is not an effect of phthisis. The effused blood and the products of the pneumonia which it produces may, under certain circumstances, undergo caseous degeneration; but, if the views of the nature of phthisis that are generally held be correct, can there be a more favouring influence for the progress of the disease than the loss of a large quantity of blood? and with this depressing influence at work it is not surprising that the deposition of tubercle should take place in the immediate neighbourhood of the seat of the hemorrhage. Even admitting, however, that phthisis is of an inflammatory origin, we cannot admit that Dr. Niemeyer's treatment is judicious. At a time when the tendency to treat all inflammatory disorders with stimulants is so prevalent, it is not likely that the proposition to leech and cup the chests of the phthisical will be received with favour. Rest, emollient applications to the chest, and the pill of opium, quinia, and digitalis are remedies, however, which find their appropriate application in phthisis.

The volume is published in a creditable form, and the translator has accomplished his part in a commendable manner. Although we have criticized freely many of the views entertained by the author, there is every evidence that the book has been carefully and conscientiously prepared, and it is one which should be read by every one who is anxious to keep himself *au courant* with the literature on this subject.

The two books of Dr. Horace Dobell, although bearing different titles, appear both of them to be written for the purpose of extolling the author's treatment of phthisis by the pancreatic emulsion of fat. It is probably well known that Dr. Dobell believes tuberculosis to be dependent upon a deficient action of the pancreas, in consequence of which too little secretion is formed to emulsify sufficient solid fat for the purposes of the economy. Dr. Dobell, therefore, proposes to supplement the action of the pancreas by introducing into the economy a certain amount of solid fat already acted upon by the pancreatic secretion of pigs. If this emulsion be administered in what is called, by Dr. Dobell, the true first stage of consumption, or, in other words, that stage which precedes the deposition of tubercle, the disease, we are told, may be arrested, and the functions of the pancreas restored. If, however, this stage be passed, the oxygen of the blood, not finding hydrocarbons enough for the purposes of heat and mechanic force in the economy, then attacks the albuminoid tissue, from which results a substance which cannot be further used, and is therefore deposited as tubercle. Cod-liver oil, the efficiency of which in phthisis Dr. Dobell cannot deny, is useful because capable, as all oils are, of being acted upon by the bile, but it cannot take the place of the solid fats. Looking upon phthisis as due to the excessive oxidation of the tissues, Dr. Dobell deprecates the administration of iron, which he says must increase this oxidation by increasing the number of oxygen

carriers. In cases in which the activity of the disease has been arrested, iron is exceedingly useful. As the pancreas is the organ at fault, any treatment must be defective which does not aim at the reëstablishment of its function. Exercise should therefore be taken, which, as is well known, stimulates all the functions, increases the appetite, and promotes the circulation of the blood. The patient should be sent in the early stages to a dry and cold climate, and bathing in or sponging with cold water should be recommended. Later, a dry and cold climate may be found too stimulating, or, according to Dr. Dobell, may promote oxidation of the tissues, and is therefore to be avoided.

We cannot accept Dr. Dobell's theory. He himself furnishes us with some facts which tend to disprove it; thus, for instance, he tells us that he has been able to discover no constant lesion of the pancreas in phthisis, and that in many cases the pancreas did not appear to be diseased at all. It is true that a disgust for fat is often felt by those who are predisposed to phthisis, but this is felt often years before the outbreak of the disease, and it by no means follows that because there is a disgust for, there is no digestion of, fat. In fevers, for example, there is often positive loathing for food, and yet patients are frequently kept alive by the large quantities which they consume. It seems to us that the feces of consumptives might be made the subject of careful investigation; we are not aware that an unusual quantity of fat has been found in them, and it is rather singular that Dr. D. has not taken the trouble to examine them.

Like Dr. Dobell, Dr. Jones believes that the treatment of phthisis should begin before the deposit of tubercles takes place, during the period of ill health which frequently precedes the more serious symptoms. It is, however, not always an easy matter to distinguish what is here called the true first stage of phthisis from several morbid conditions in which recovery is the rule. In all cases of the tubercular cachexia, Dr. Jones tells us, there is an evidence of mal-nutrition, and this mal-nutrition will be found dependent upon one of three causes: 1st, an imperfect condition of the blood; 2d, a diminution of the supply of blood; 3d, inability on the part of the blood to draw nourishment from the food. The principal alteration of the blood will be found to be a diminution in the number of red corpuscles, and the important part which these little bodies play in the organism is shown by the analogy which exists between their contents and the juices of muscles. A very important function which they also perform, is the conveyance of oxygen to the different tissues, and the importance of maintaining them in proper numbers is shown by the fact that a low degree of temperature is always obtained in any case where they are notably deficient. As a consequence of the diminished quantity of red corpuscles the metamorphosis of the tissues is deficient by reason of the small amount of oxygen conveyed to them, and to the products of this deficient metamorphosis he traces the deposition of tubercle, differing, it will be seen, widely from Dr. Dobell, who believes the deposition to be due to the over oxidation of the albuminoid tissues. With this view of the nature of phthisis it is not surprising that Dr. Jones should place great reliance on the administration of iron in all stages of the disease, and of the different preparations of iron he thinks none is so entirely satisfactory as the perchloride, which may be administered either with or without the addition of cod-liver oil, the iron making, he thinks, the oil less nauseous. Dr. Jones agrees with Dr. Niemeyer in believing that hæmoptysis frequently occurs in those who are not at the time tuber-

culous, but he thinks that it never occurs unless the walls of the blood-vessels are in a weak condition. In regard to the climate in which phthisical patients are most likely to do well, Dr. Jones says that a dry, sunny, not too warm, climate is to be preferred, one in which life in the open air is possible the greater part of every day.

In speaking of the colliquative sweats which so frequently annoy the patient, Dr. Jones traces them to the escape of the hydrocarbons by the skin from the blood. The sweat glands as well as the sebaceous glands secrete a large amount of fat, and if the sweat is excessive, this secretion of fat will be very much increased; in phthisis, moreover, the fatty matter in the blood appears to act as a stimulus to the sweat glands. If iron be now administered the quantity of oxygen in the blood will be increased, and oxidation of the fats being effected the sweating will cease. It is not easy to reconcile this opinion with that held by Dr. Dobell. In the one case the fats are asserted to be in excess, and in the other deficient.

Dr. Thorowgood's theory of the nature of phthisis, stated in as few words as possible, appears to be as follows: The nervous system is, he thinks, principally at fault, in consequence of which nutrient matters are not absorbed and properly assimilated and deposited as healthy tissue, or, on the other hand, the products of tissue waste are not converted into such bodies as can be excreted from the body by its various emunctories, and as a consequence both the badly assimilated food and the products of retrograde metamorphosis are deposited as tubercle. Dr. Thorowgood thinks, moreover, that there is an excessive oxidation of the phosphorus in the tissue. Now it is well known that phosphorus is an essential constituent of the nerves, and of the brain substance, and it is reasonable to suppose that by supplying phosphorus in an oxidizable condition its excessive oxidation in the tissue may be arrested, and the assimilative and nutritive functions restored to health. The excessive oxidation is shown by the increase of the phosphates in the urine and by the high arterialization of the blood, which Dr. Thorowgood believes to be due to an excess of the phosphates. In relation to this subject, he says: The rapid oxidation of the phosphorus of the tissues "may disintegrate these bodies in such an irregular way, and cause their elements to collect in the blood in such form as to be unfit for tissue structure and only fit for deposit as tubercle." Entertaining this view of the pathology of phthisis, it is not surprising that our author should recommend the administration of phosphorus. But it can be regarded as little more than a palliative, for surely we cannot modify a diathesis which predisposes to the excessive oxidation of phosphorus or to its mal-assimilation by the administration of that article.

Phosphorus itself, or the phosphorized oils are disagreeable remedies, and the phosphates, being already highly oxidized, would not fulfil the indication; it is, therefore, proposed to give the hypophosphites, hypophosphorous acid being composed of one equivalent of phosphorus united with one of oxygen. Of the hypophosphites Dr. Thorowgood prefers the salt of soda, but this sometimes disagrees with the stomach, and then the hypophosphate of lime, iron, or quinia may be given. In cases, however, where hemorrhage is feared the iron had better not be given.

In 158 patients, 100 of whom were in the first stage of phthisis and 58 in the second and third stages, who were treated with the hypophosphites, and of whose cases Dr. Thorowgood has notes, and which, we are led to believe, were not selected cases, the results were exceedingly favourable. Thus, of the cases in the first stage 44 were very much relieved and able

to return to their employments; 47 were relieved, and in 9 no improvement was observed. Of the 58 cases in the second and third stages, 8 were cured, 23 were much relieved, 15 were relieved, 7 were unimproved, and 5 died. This is rather a more favourable result than most of us are likely to meet with in the treatment of phthisis; but it is difficult to say how much was due to the hypophosphites, as in most of the cases, cod-liver oil was administered and other medicines were given as they seemed to be indicated. Although we should not be inclined to trust entirely to the treatment by phosphorus in phthisis, there can be no doubt that it will often be found of service. Dr. T. is inclined to think that in cases complicated with laryngitis its use will not be followed by much benefit.

The books of Drs. Bennet, Patterson, and Atkinson treat principally of the influence which climate exercises upon phthisis. Dr. Bennet was in early life threatened with this disease, and determined to try the effect of climate in arresting it. After some little experience he has been induced to recommend "the Coast Ledge, which forms the north shore of the Mediterranean from Cannes to Pisa," and he speaks of the climate as cool, sunny, bracing, stimulating, and dry. On the contrary, Dr. Patterson writes for the purpose of proving that Egypt presents many attractions for the phthisical patient. He says that his book contains "the expression of a few simple meteorological data, carefully registered by the author and a few friends, to which the necessary explanations have been added." He considers that the kind of climate likely to be beneficial to a pulmonary invalid is that characterized by "a warmer temperature, a purer, and generally, a drier air, a greater amount of solar light, and freedom from rain. In short, he (the invalid) seeks to be placed under circumstances where he is able to take regular exercise in the open air, &c. &c." The mean temperature at Cairo for four years is as follows: January, $58\frac{1}{3}^{\circ}$ Fahrenheit; February, 57° ; March, $65\frac{3}{4}^{\circ}$; April, 70° ; May, 77° ; June, $81\frac{1}{2}^{\circ}$; July, 86° ; August, $82\frac{1}{2}^{\circ}$; September, $82\frac{1}{2}^{\circ}$; October, 78° ; November, 69° ; December, 59° .

During these four years there was an average of fourteen showers a year, and as the weather was bright and clear, the invalid could be constantly in the open air. The average temperature is, we think, rather high in at least six months of the year, for the statistics of the French army prove, as quoted by Dr. Bennet, that soldiers suffering from phthisis get worse in warm climates, and it is well known that the extreme heat of our summer proves extremely fatal to those in the third stage of phthisis. Both Dr. Bennet and Dr. Patterson caution those who seek relief from their disease in other countries, not to live differently from their usual mode at home. The good which climate does is often undone by the excesses which are committed in foreign countries.

Dr. Bennet is a firm believer in the curability of consumption, in fact he has every reason to believe that in his own case the disease has been permanently arrested; he mentions the fact, however, that patients cured of phthisis are very apt to die of Bright's disease, and this fact, he says, has been noticed by others. Believing that consumption is a general disease, the medicinal treatment recommended by Dr. B. is addressed to the improvement of the constitutional condition. A moderate amount of exercise, free ventilation, and constant bathing, are particularly insisted upon.

Dr. Patterson thinks that patients in the first stages are more likely to be benefited by a residence at Cairo, while those in a suppurative stage are frequently injured; to the latter class of patients, Alexandria is perhaps more likely to be beneficial.

We confess that we experienced a feeling of disappointment after reading Dr. Atkinson's book. We have so long been convinced that a change of climate was often unscientifically prescribed, that we were in hope that this book would contain such data or rules as would guide us in the selection of places to which to send our consumptive patients. He begins by telling us that change of air should be prescribed as carefully and as understandingly as any article in the *Materia Medica*; but when he tells us that "to stay morbid action in the lungs, a moist, low, marshy situation is preferable to a high and dry," or again, when we find him recommending that hospitals should not be too well ventilated, as he has frequently known patients, brought from their homes in courts and alleys, to find the air of hospitals too stimulating, we are not particularly impressed with his fitness to judge of the applicability of this remedy to particular cases. We have seen few cases of phthisis in which there was not a temporary improvement after admission to a hospital, and the subsequent relapse is not so much due to the stimulating air of the hospital, as to the depressing moral influences with which the patient is surrounded. Nor can we regard the recommendation, that the patient should confine himself to one or two rooms which had better be hermetically sealed, as judicious. That we should hesitate before recommending a patient to quit a comfortable home for the discomforts and annoyances which he must encounter in travel is very true, but what can be worse than the kind of life to which he condemns his patients. For the purpose of giving the reader a specimen of the author's style, we quote the following:—

"Balmy breezes, saline springs of professed medicinal virtues, and in some cases evidently curative, yellow sand with sparkling waves or foam-fringed billows, beating in wrathful mood against the granite bulwarks of the beetling shore, however inspiring to the healthful, will avail little to calm the seething brain and lull the sleepless eye of the feverish invalid."

And a little farther on we are told,

"Hope waves her starry wings over the sufferer, and glowing health is seen in the distance. Alas! darkness shrouds the brilliant scene—the invalid returns—only to die."

We might copy many passages of equally fine writing, but we have quoted sufficient to show that the subject is hardly treated in that serious mood which is fitting in a medical book. Some of the statements are exceedingly absurd; for instance, he says:—

"The stethoscope is adapted for those who have an acutely sensitive auditory organ, and who on that account are very rarely blessed with the other four senses, viz., tasting, smelling, seeing, touching, or feeling in an equal degree of perfection."

And some of our readers will be startled to find that the necessity for the presence of a certain amount of carbonic acid in the atmosphere is supposed to be proved, because if the school-boy finds he cannot fall asleep, the first thing he does is to bury his head under the bedclothes.

Dr. Cotton's little book is an admirable one of the kind, the physical signs of consumption being so arranged that the student may become readily acquainted with them. To the present edition of the book is appended a chapter on the signs indicative of an arrest of, or improvement in, the pulmonary disease. Although perfectly willing to admit that Dr. Cotton has done his work well, we cannot see what useful purpose such a book answers, as all that can be learned from it is to be found in the systematic treatises on Diseases of the Chest.

J. H. H.

ART. XV.—*Treatise on the Diseases of the Eye.* By STELLWAG VON CARION, M. D. Translated by CHARLES E. HACKLEY, M. D., Surgeon to the New York Eye and Ear Infirmary, etc. etc., and D. B. ST. JOHN ROOSA, M. D., Clinical Professor of the Diseases of the Eye and Ear in the University of New York, etc. Illustrated by ninety-six woodcuts and eighteen chromo-lithographs. 8vo. pp. 774. New York: William Wood & Co. 1868.

THE practice of ophthalmology, from being one of the most obscure and consequently unsatisfactory branches of medical science, has become within a short period one of the most exact in regard to diagnosis, and rational as to treatment. So great has been the revolution in regard to ocular therapeutics that the so-called "recent advances" made in this department may be now considered as constituting the greater part of the entire art of ophthalmology. Far advanced as we undoubtedly are in other departments of medical science, it appears to us that the advances lately made in this special branch have not been as freely acknowledged, or as carefully cultivated in this country as their importance would demand. Strange as it may seem, no good and complete text-book, which can lay claims to adequately representing the entire science of ophthalmology as it exists at the present day, has yet appeared in the English language.

The student in these matters, denied the advantages of a foreign education, has been compelled to gain his information where he might, but particularly from journals and ophthalmic reports. But, as a usual thing, journal reading is to medicine what magazine reading is to literature—incomplete and inconsecutive; while however useful and instructive monographs and special essays may be to an adept in a science, they are generally unintelligible and discouraging to a beginner.

It was, then, to meet the wants of the student in ophthalmology, be he a graduate or otherwise, that the work, whose title stands at the head of the present remarks, owes its appearance in English. And though no doubt could possibly be felt as to the pressing necessity of such a book, still, a good deal of surprise might be expressed at the selection of the author, for Stellwag Von Carion can hardly be called a fair representative of the art of ophthalmology as it is practised and taught by the leading men of the country to which he belongs. Still, this surprise cannot fail to be lessened, and the choice in part justified, when the fact is taken into consideration that, even in Germany, there are few good and complete text-books on the eye, and that among these there can be but little doubt that Von Carion is the most complete, as it certainly is one of the most recent.

It is the individuality of the work which constitutes its chief merit, and as the expression of the power of observation, concentration of thought, and wide extent of learning, it will probably maintain for some time a high position in this department of literature. It will, however, probably be among the last, if not the last, of even moderately successful individual attempts to cover, however incompletely, the rapidly extending field of ophthalmology; and the future productions of this kind will consist, as does the great work of Wecker, of a skilful combination of the results of the labours of special observers in the different branches of this art.

Before passing to a consideration of the book itself, we cannot help expressing our disappointment at the manner in which the present publishers have thought fit to produce the work. Surely the great and conscientious

endeavours of the author, and the perseverance of the translators, deserve a more fitting requital for their labours. In quality of paper, type, and printing, the book can bear no comparison with the original; while the numerous "woodcuts" are positively painful to any one not unnaturally wanting in sensitiveness.

The first impression which the book is calculated to make on the mind of the busy practitioner, or hard-pressed student, is rather that of dismay than pleasure, and he would be apt rather to turn away from so ponderous a volume, than to wearily plod through a work which must strike him as uselessly prolix and unduly inflated. This impression, however strong it may be at first sight, cannot fail to vanish upon even the most trivial acquaintance with the author; and it requires but little reading to convince one's self that it is rather from the accumulation of a multitude of subjects than from the undue inflation of a few, that the book owes its ponderous proportions. Having conquered his prejudices in this respect, the reader is met at the very outset of his investigations into ophthalmic science, with a rebuff of no light character, in the shape of thirty-four closely printed pages of "General Observations" on the treatment of diseases of the eye, all of which would be much more rationally treated if under special heads; and some of which are of so abstruse a nature, as, for example, "intra-ocular and intravascular pressure," as to be barely intelligible to the most advanced students in ophthalmological physiology, and which are much more suitable for an appendix than an introduction.

The curious manner in which the author has chosen to classify the subjects under consideration cannot fail to strike the least observant, and cause a feeling of wonder how any writer could even tolerate, much less approve of, an arrangement which cannot but detract in a great degree from the general merit and usefulness of the book. To begin with a consideration of the diseases of the cornea, to pass thence to those of the vitreous body, thence to the optic nerve, then to the affections of the retina, from the retina to the choroid, from the choroid back again, as it were, to the diseases of the conjunctiva, followed by those of the lid, lachrymal passages and orbit, and then to the troubles of the lens. Surely all this is as unmethodical as it is unusual, and as inconvenient as it is unscientific.

However much fault might be justly found with the general arrangement of the work, none certainly should be with that of its special sections. The habit which Stellwag has of tersely, but clearly defining the disease itself, and then passing to a brief but always systematic and forcible discussion of the symptoms, course, prognosis, and treatment, is one which cannot be too highly commended or too fully imitated; while the bibliographical list, at the end of each section, is a perfect mine of wealth to those who would wish to pursue more in detail the subjects which the author has touched upon in the text.

Section I. treats of the diseases of the cornea, and opens with the description of its anatomy, which is a condensed but on the whole pretty accurate representation of our present knowledge of the structure of this membrane. This is followed by a consideration of the effect of the inflammatory process upon corneal tissue, and it is to be regretted that the author did not give more time and space to the consideration of the general characters of keratitis, and less to that of its various modifications.

It is to the labours of Virchow, His, Arnold, and Coccius, that we owe our present exact knowledge of the cornea; and Stellwag has followed the above mentioned authorities in believing that "the inflammatory changes

patent to our observation proceed from the corneal corpuscles by proliferation of these bodies, and segmentation of their contents." It is to be hoped that this part of the book will have the careful perusal that it deserves, and that it may be influential in lessening the frequency of the use of those vague terms "exudation and infiltration" as applied to want of transparency of the cornea, which is in reality due to a change in the condition of the cells themselves. These general considerations in regard to the inflammatory changes are followed by the description in detail of the various kinds of keratitis; and amid so much which is so sound in theory and judicious in practice, one is somewhat astonished at meeting with occasional instances of what seems to be quite the reverse. We doubt very much the propriety of even omitting in ulceration of the cornea, whatever its position, the use of atropia, the soothing influence of which upon the membrane itself, and good effects in preventing the action of the ciliary muscle, have become finally established. Much less can we coincide with the author in recommending the employment of so powerful and irritating an agent as Calabar bean, for the purpose of preventing a prolapse of the iris, should a circumferential ulcer perforate. The indications for the use of atropia, the abstinence from that of washes having a metallic basis, and the necessities for the performance of paracentesis, are excellent in themselves, and if at all reasonably carried out by the practitioner, will probably be the means of saving many eyes which would otherwise be irrevocably lost.

Section IV. is devoted to the retina, and opens, as is always the case with the author, with a detailed, but at the same time very condensed description of the anatomy of the part. So much has this been the case, that this portion is but a collection of facts and citations, so numerous in quantity, and of so arid a quality, as to pass from the mind of the reader the moment the eye leaves them; the desiccating process being carried so far that one has great difficulty in recognizing even the active principles abstracted from the researches of Müller, Virchow, and Wedl.

However much we may congratulate ourselves upon the exact knowledge that we possess in regard to the normal anatomy of the retina, we certainly have but little upon which we can plume ourselves in regard to that of its pathological changes. Of the views which have been laid down by modern observers, Stellwag has followed, in most essential points, those which seem entitled to most weight; and his statements in regard to the inflammatory changes incident to this membrane are probably, as far as they go, reliable.

The general description of the characteristics and symptoms of retinal disease are well given, and exceedingly well illustrated by the ophthalmoscopic plates; so well, indeed, that we cannot but regret that in the treatment of these troubles the author shows a strong leaning, in the obscurer forms of retinitis, towards adopting the national aphorism, "When in doubt, give bichloride." Few American practitioners will be willing to accept without hesitation the advice offered for the treatment of diffuse retinitis:—

"As a direct means, mercury is almost universally considered necessary, even without regard to a syphilitic origin." (p. 145.)

Still less would he be willing to believe that, in detachment of the retina, where the inflammatory origin of the disease is shown by diffuse cloudiness of the retina and vitreous, "mercurials may be used advan-

tageously." (p. 182.) The author is, however, decidedly averse to any operative interference in these cases, whether performed according to the manner suggested by Sichel, Bowman, or Wecker.

The chromo-lithographs illustrating the morbid changes in the retina incident to Bright's disease are exceedingly well executed, and give so vivid a picture of this affection as to render it impossible for any one, who had seen the plate, to fail in making a correct diagnosis of the disease.

Section V. is devoted to Iritis, and we cannot but regret that this chapter is not as fully written as so important a subject merits and demands. Of all eye troubles there is probably none whose occurrence is more frequent, or whose results are more disastrous than iritis, or one the treatment of which is really so little understood, or less skilfully applied. The use of strong mydriatics is certainly advised by the author; but the employment of atropia from the very commencement of the disease till long after all inflammatory symptoms have disappeared, is not, it appears to us, insisted upon with sufficient force, especially for this country, where its use is less general, or where it is even supplanted oftentimes by the inefficient extract of belladonna.

Nor can we approve of the recommendation to separate by surgical interference such posterior synechiæ as will not yield to powerful mydriatics, nor can we coincide in the opinion that the "brilliant results and entire want of danger in the operation, which has been called corelysis, are estimated highly." (p. 193.)

The fact that from the condition of the iris alone, no certain diagnosis can be made between syphilitic and non-syphilitic iritis is forcibly put (p. 185), and is based on clinical experience, together with the fact that "gummy tumours are not necessarily connected with the existence of secondary syphilis, and, on the other hand, they show nothing by which they may be distinguished from simple inflammatory products." (p. 178.) (*Virchow*.) The fact, too, that "the most inconstant symptom of iritis is pain, and that this is not unfrequently entirely absent, or so slight that it scarcely exacts the attention of the patient," is one which, though it may be a revelation to some, ought to be understood by all. In this connection it strikes us as somewhat curious that the author, although he has mentioned its occurrence, has not dwelt more on serous iritis, one of the most dangerous, because one of the most insidious, of all forms of iritis.

The indications for the performance of paracentesis corneæ in connection with iritis, and especially that of iridectomy, are judiciously chosen and clearly stated, and, if observed at all as they should be, the percentage of eyes daily lost for want of the timely performance of these operations will be immensely lessened. Though no objection could be raised as to the indications for iridectomy, still the manner in which it is directed to be done, especially as to its position, is, it appears to us, open to criticism. It is true that no precise rule can be laid down as to the exact position of the incision, as this will be influenced by the condition of the anterior chamber and state of the sclerotic, which may be so much affected as to necessitate the making of the wound, at, or just within, the corneal boundary. Still, we very much doubt the propriety under any condition whatever of making the "incision fall a little outside of the middle of the corneal curvature." (p. 197.) The result of such a proceeding, in case of faulty, or vicious cicatrization of the wound, could not be but detrimental to vision, and unsightly in appearance.

Section VI. is devoted to the choroid, and is a good example of the

great care and research which have been employed in the compilation of this wonderful book. Of so uniform a character is this section, and so little does it differ from what has previously appeared on this important subject, that there is little deserving of special comment, still less of criticism. In speaking of enucleation, however, the following sound advice is worthy of more prominent notice, and a better translation than that given to it in the three lines of very small print :—

“Recently the propriety of not undertaking the enucleation, except during marked remissions of inflammation, has been very much spoken of, for if done at other times, the operation has been seen to be of little or no use.” (p. 235.)

In regard to the treatment of these choroidal affections some doubt might be entertained whether “a well-conducted mercurial inunction *is* one of the best antiphlogistic means, especially when combined with the systematic wearing of a protective bandage.” (p. 234.) We should hesitate about the propriety of keeping systematically shut from our inspection an eye which may require at any moment an operation, and we can see but little indication, when the trouble has not a specific origin, for further reducing by a process of mercury, a patient whose condition is oftentimes one of extreme debility from pain and wakefulness. The necessities for, and advantages of, an iridectomy in certain conditions of choroiditis are forcibly dwelt upon.

Under the head of choroidal affections, the author also includes glaucoma; and the fact that the choroid plays so important a part, both in its development and progress, would appear to justify, to a certain extent, such a classification. But it has always appeared to us more logical to look upon glaucoma rather as a symptom than a disease, or if in reality a disease, one whose causes may be many, but whose results are always expressed by a few prominent features. Or, in other words, we incline to that view which holds that glaucoma is but the expression of the want of equilibrium, existing in health, between the capsule of the globe and its contents; the volume of the latter being disproportionately large for the capacity of the former. Therefore, changes in any membrane of the eye capable of producing such a result are capable of producing glaucoma. Thus we see glaucoma arising from a serous iritis, and even the author admits that “at times a keratitis or an iritis may lead to a glaucoma.” (p. 242.)

The statement that “glaucoma is developed only on ground prepared for it,” amounts to saying that glaucoma is glaucoma. Nor do we think that the author has been so happy, as is usually the case with him, in the description of the symptoms of the disease. How difficult a task he had in giving the symptoms of so vague a trouble, is well illustrated by those which he has cited:—

“These comprehend the sensible increase in the hardness of the globe, the ophthalmoscopic appearances of excavation of the optic nerve, the symptoms of hyperæmia and inflammation, as well as a great variety of disturbances of vision.” (p. 236.)

There is not one of these which is a constant accompaniment of the affection. In the first place, the “sensible increase in the hardness of the globe” may be entirely wanting, a fact which the author himself has strongly asserted by saying (p. 216) that “the resistance which the globe of the eye gives to external pressure is oftentimes no greater in undoubted

glaucomatous eyes, than in those which are decidedly healthy;" while he further adds:—

"If the increase in the intra-ocular pressure ceases to be an unmistakable evidence of the existence of glaucoma, the rigidity of the capsule of the globe may be all the more one." (p. 217.)

Again, in regard to "excavation of the optic nerve." It has been proved beyond a question of doubt that we may have even several attacks of acute glaucoma without any trace of excavation; a fact which the author himself corroborates (p. 250) by observing that "occasionally cases occur where, after repeated acute attacks, the visual power spontaneously reaches a high point after a time, and no excavation can be observed."

We also very much doubt whether, as the author asserts (p. 238), the diminution in refraction, which oftentimes accompanies glaucomatous troubles, is "the result of flattening of the cornea." We have much better authority for believing it to be due to flattening of the lens. (*Donders.*)

It appears to us that, taken as a whole, this chapter is neither philosophically conceived nor clearly expressed, and gives but a very inadequate representation of this fearful disease.

The chromo-lithographs illustrating the glaucomatous ophthalmoscopic appearances are excellent, especially that showing the earlier stages of the disease. This we consider important and highly instructive, as it exhibits a condition in which iridectomy would be most productive of good.

Under the head of treatment, the necessity for an early iridectomy, as the only successful means of cure, and the kind of cases in which it should be employed are clearly laid down; while the author justly observes that "the objections which still cling to iridectomy do not remove the indications for it, but only render a guarded prognosis necessary." (p. 247.)

The guarded and careful manner in which the author speaks of the curative powers of iridectomy, and the freedom from any tendency to underrate the difficulties and dangers of the operation, are in themselves a pleasant contrast to the opinions of most of his countrymen, from whose writings it would almost appear that the iris was created for the express purpose of having one or more iridectomies bestowed upon it.

However much they might approve of the operation of iridectomy in glaucoma, few would, we think, be willing to coincide with the author's view as to the manner in which it acts, or believe with him that—

"It even seems as if the curative effect which the operative methods that are employed for glaucoma produce, is due to the fact that a large segment of the sclerótica is incised, and the wound again united by a distensible cicatrix, which may, in some degree, replace the loss of elastic distensibility." (p. 237.)

The common opinion always has been, and still is, that "a distensible cicatrix" is one of the most calamitous results which follow the performance of iridectomy, it being always detrimental to the health of the eye, and sometimes involving it in ruin.

Section VII. is devoted to diseases of the sclera, and the important subject of sclero-choroidal staphyloma is handled with care and ability.

Section VIII. is devoted to the troubles of the conjunctiva, and the mildness which characterizes the treatment of these diseases, in comparison with that usually laid down in text-books, is worthy of observation and imitation.

Sections IX., X., XI. are devoted respectively to diseases of the lids, lachrymal passages, and orbit. With the last section Part I. closes.

Part II. consists entirely of an essay, or rather compilation, upon tumours incident to the eye and its appendages, and is certainly one of the best, as it is the very dryest that we have ever encountered.

Part III. is entirely given up to the consideration of cataract, and this chapter is, on the whole, the best in the book. It is a complete monograph in itself, and treats the entire subject with a fulness and breadth not apparent in the other parts of the work. No one would, of course, be willing to indorse fully everything which it contains; still, few would be unwilling to admit that it gives a fair and complete *résumé* of the various forms of cataract, and their many methods of treatment now in use. Of so technical and descriptive a character is this chapter that the limited space of a general review is entirely too restricted to do it anything like justice; we must therefore refer the reader to the book itself.

Part IV. comprises "Functional Diseases," and is mostly taken up with a consideration of the disorders of refraction and accommodation. It has been the common opinion amongst the oculists of this country, that the author's knowledge concerning medical optics was neither very extensive nor very deep. This opinion we think erroneous, and our belief is that it took its origin, in great part, from some rather severe, and not very just strictures passed upon the author by the celebrated ophthalmologist and physiologist of Utrecht; though it is partly due, no doubt, to the fact that Stellwag, especially in his former editions, chose to express his views, which were correct enough in themselves, in a phraseology as unique as it is obscure. The true difficulty we believe to be, not that the author does not fully understand the subject which he attempts to treat, but that in order to avoid the diffuseness of former writers, and the introduction of intricate mathematical formulæ, he has so condensed his explanation of these subjects as to render them barely intelligible. The difficulty, it seems to us, is, that he states too much and teaches too little.

After some preliminary remarks on the anomalies of refraction and accommodation the author takes up the important subject of myopia, and deals with it as judiciously and thoroughly as the short space which he has allowed himself will permit. Contrary to what is usually the case with Stellwag, it is the treatment of the disorder which meets with our greatest approval, characterized as it is by an amount of good sense and judgment not often met with in other parts of the work. What the writer says in regard to the prophylactic treatment as to the choice of myopic children's amusement, and the especial importance of rightly guiding their mode of study, the manner in which they should sit, and the duration of their employment, is as true as it is important, and we especially recommend the following passage to those practitioners who imagine that the height of prudence and the summit of optical knowledge are reached by invariably prescribing the use of glasses for near work to myopes:—

"The use of suitable glasses is not in itself injurious; on the contrary, spectacles of a proper focus and with suitable frames are to be considered as powerful therapeutic aids, which, by the neutralization of existing errors of adjustment, decidedly lessen the dangers attending short-sightedness, and hence they may be indicated in early age." (p. 596.)

The assertion, that "in low grades of developed myopia senile changes are often sufficient to render the eye far-sighted or even hypermetropic" (p. 591), we believe to be true notwithstanding the high authority against such a view. (*Donders.*)

The chapter on hypermetropia is, certainly, one of the poorest in the

book, and it is difficult to conceive how any one, so well acquainted with the subject as the author really is, could have written so poorly concerning it. Principles which are simple in themselves, and within the comprehension of all, are so handled by the author as to be nearly unintelligible, and the whole chapter is much more calculated to confound than to teach. Refraining from entering into details, which the limits of a review and the patience of our readers would prohibit, it seems inexplicable that one who, in his preface, states that he was the first to describe the true principles of the anomalies of refraction and accommodation, and to insist that "the nucleus of this subject lies in the strict separation of refraction and accommodation," should so far forget his own discovery as to assert, that among the diseases capable of developing hypermetropia "the chief is paralysis of the muscle of accommodation, as it often causes decided decrease of refractive power." (p. 603.) We can easily understand how the paralysis might bring forth the hypermetropia that had previously been latent, but how it can *cause* hypermetropia is beyond our comprehension. That hypermetropia is, as the author states, not always congenital, we believe to be true, though we cannot agree with him in regard to all the causes which he alleges may produce such a result.

We also believe with him that the "pathogenetic connection between hypermetropia and convergent squint has hitherto been insufficiently or falsely explained." Still, the explanation which the author himself gives and alleges to be "undoubtedly" correct, does not, as far as we can see, remove the insufficiency of former explanations or add a single new reason to the many which have been given as to the connection between the two conditions.

Many subjects worthy of comment, excellencies as well as deficiencies, have necessarily been passed over; but enough has been said to give the reader an idea of the general characteristics of the book. Its chief fault is that it is of too encyclopedical a character, and is rather a collection of ophthalmological facts than a broad and comprehensive treatise on the great principles of ophthalmic surgery. Still, no one can deny that if Stellwag is not a very philosophical writer he is a conscientious one, and if not a very original observer, he is, at least in most cases, a safe guide; and we have no hesitation in saying that his work, as a whole, is far the best which has as yet appeared in English; and as a book of reference for the consultation of authority in matters pertaining to the eye, is, probably, without its superior, even if it has its equal, in any language.

Hitherto our remarks have been restricted to the consideration of the subject-matter of the work itself, and not to its translation, concerning which it would be affirming too much to say that in all respects it is as perfect as might be wished; for oftentimes the meaning is obscured, sometimes even perverted. Still, in these exceptional cases the fact must be borne in mind that the original is an example of as difficult, not to say as poor, German as probably exists in medical literature; written as it is in a dialect and phraseology rarely, if ever, heard beyond the limits of Vienna. As we are not among the very few in this country who possess a thorough knowledge of the Viennese dialect, we cannot but feel that the translators are entitled rather to our thanks than our criticisms; nor can we help expressing our admiration of the courage which prompted and the perseverance which has accomplished so colossal an undertaking.

E. L.

ART. XVI.—*The Surgical Treatment of the Diseases of Infancy and Childhood.* By T. HOLMES, M. A., Cantab., Surgeon to the Hospital for Sick Children, etc. etc. 8vo. pp. xxvi., 648. London: Longmans, Green, Reader, and Dyer, 1868.

It has long been a favourite project with the author of this handsome volume, as we learn from his preface, to furnish a systematic treatise upon the practical surgery of children's diseases. Some special subjects he has omitted, such as affections of the eye and ear, and of the skin, club-foot, etc., for the reason that these are already abundantly dealt with in text-books that are in the hands of every one interested in those subjects. With these exceptions, Mr. Holmes has endeavoured to embrace everything connected with the practical surgery of childhood, and now, on the eve of resigning his position in that institution whence his material for observation has been principally derived, presents the fruit of his labours to his colleagues and to the profession at large as an evidence, he modestly says, that he has "at any rate attempted to use the opportunities so liberally afforded."

In what manner and with what success he has accomplished his design, it is our purpose to inquire; and in so doing we shall endeavour to furnish to our readers a short but sufficient abstract of the more important matters which are embraced in the various chapters of Mr. Holmes' treatise.

From motives of convenience, our author divides his work into three parts; the first, containing thirteen chapters, being devoted to *malformations*, and the second and third, containing respectively five and nineteen chapters, dealing the one with *injuries* and the other with *diseases*.

In Chapter I. our author treats of *joined twins, attached and included fœtus, and congenital sacral tumour*. Several cases of joined twins are referred to, the best known being the Siamese twins and the Hungarian sisters. With regard to the former Mr. Holmes may be pleased to hear that they are in good health, married (we believe to sisters), and, if newspaper report be reliable, soon about to test the possibility of separate existence by submitting to a division of their connecting band by surgical interference. Of the eight cases of joined twins which Mr. Holmes has collected, only one was successfully subjected to operation (König's case) and even in this it is doubtful whether the supposed uniting band was anything more than a fusion of the two umbilical cords. In another case (Treyling's) an attempt was made to separate a pair of female twins when they had attained the age of four months, but unfortunately with fatal consequences.

"The result then of our present limited experience in the matter of joined twins appears to be, that when the band of union is rather the result of a fusion of the umbilical cords than of any portions of the bodies of the fœtus, the attempt to separate them may be made with good prospect of success; but that when the sacral regions are blended together the chance is very great that the spinal cords or some other vital parts are united, and that in this and all other regions it is only with great hesitation and circumspection that any such attempt ought to be countenanced."

Next to cases of joined twins, those of attached and included fœtus are considered, the latter being a mere variety of the former, the monstrous growth being imperceptible at birth, and not developing itself for a greater or less time subsequently. Of the malformation known as *attached fœtus*

"the most common example is the presence of a monstrous third lower extremity growing from the sacral region between the natural legs." This is not, however, the only situation in which such growths have been observed. In a native of Macao, the dwarfed remains of a twin foetus projected from the chest, and in a case successfully operated upon by Prof. Pancoast, of this city, the cheek was the seat of the abdominal development. [See *Holmes' System of Surgery*, vol. iv. page 804.]

With regard to the treatment of these cases, it is believed by our author "that the attempt to remove attached foetal remains is in many instances highly advisable, and the more so as the primary growth seems no measure of the extent which it may ultimately reach. . . . Nor if the parasitic formation seems too large to be removed at one operation, can there be any reason . . . why it may not be strangulated in parts or removed piecemeal. . . . In the case of supernumerary limbs it does not appear necessary to entirely eradicate them, as no doubt the removal of the part which projects visibly would be sufficient."

The next topic for discussion is the congenital foetal tumour, generally situated in the sacral region. Nearly allied to these are those cases where congenital tumours are found to contain bones or even dermoid elements, such as teeth or hairs. In many of these cases it is extremely difficult, if not impossible, to ascertain positively whether or no there be any connection with intrafoetation.

"It is clear enough . . . that in congenital sacral tumour, whether from foetal inclusion or no, the question of surgical interference depends not on the origin but on the connections of the tumour; that is to say, that there are foetal tumours which may be removed with perfect success, while there may be other tumours, not foetal, in which the formation may be so far within the pelvis as to be inaccessible to the knife. Another point is, I think, equally clear from the records of the treatment of such cases, viz., that the total removal of the tumour is a safer course, if surgical interference is admissible at all, than any partial operation."

"*Congenital Innocent Tumour, or Hypertrophy*," is considered in Chapter II. The latter designation Mr. Holmes believes to be anatomically the correct one, for "the congenital 'tumour,' as for surgical purposes we must call it, is really nothing more than an exaggeration, as it were, of the normal tissue of the part." The congenital hydrocele of the neck is not, strictly speaking, a tumour in the sense which reserves that term for neoplasms or new growths, but an enormous development of the natural areolar spaces and of the septa which separate them. Still, it is convenient to retain the term congenital tumour, and with this explanation Mr. Holmes proceeds to consider the regional anatomy of these growths, their progress, diagnosis from other congenital affections, and appropriate treatment. Much valuable and interesting information is given under these heads, for which we must refer the reader to the work itself; with regard to the treatment, however, we may observe that Mr. Holmes rejects such measures as the use of large setons, *cautérization en flèches*, and successive incision of cysts, preferring the use of small setons or the injection of iodine in cases where the cystic element predominates, and complete extirpation in the cases of solid growths or where milder measures have failed. It should always be borne in mind, however, that many congenital tumours remain inactive for an indefinite time, and some certainly undergo a spontaneous cure; hence, in a considerable number of cases, no treatment whatever is to be recommended.

Fatty tumours are occasionally congenital, and still more rarely cancerous

growths are met with in new-born infants. *Dermoid cysts* are most usually found near the outer and upper angle of the orbit; they should be removed as soon as possible. Congenital dermoid cysts of the scalp are of especial interest on account of their occasional great resemblance to cases of meningocele.

A handsome coloured plate accompanies this chapter, giving the appearances before and after operation of a remarkable case in which a congenital hypertrophy was covered with a warty growth. The operation was completely successful.

The subject of *Nævus* is treated of in Chapter III., which contains many interesting remarks with regard to the diagnosis and treatment of this affection. A curious case is quoted from Guersant, where a meningocele was mistaken for *nævus*, and treated by the introduction of setons, the error in diagnosis not being revealed until after the death of the patient.

"I have not as yet seen, nor can I discover, either in published cases or in the experience of my surgical colleagues, any case in which a congenital *nævus* has proved fatal. . . . This is a significant fact in discussing dangerous operations for its cure."

Mr. Holmes does not recommend the treatment by total excision or enucleation as advocated by Mr. Teale in the last volume of the *Medico-Chirurgical Transactions*. (See notice in No. of this Journal for April, 1868, p. 488.)

Malformations of the skull, encephalocele and meningocele, are discussed in Chapter IV. Both of these affections appear to be caused by one or other variety of hydrocephalus, and while their seat is commonly the occipital region, they are occasionally met with in other parts, and several cases are related to illustrate the occasional difficulty of diagnosis under such circumstances. With regard to the treatment Mr. Holmes gives the following practical directions, which he believes to be the best that can be laid down from present experience :—

"1. As a general rule nothing ought to be done beyond supporting the tumour and making gentle pressure by means of some bandage or cap, lined with cotton-wool, to prevent ulceration. Perhaps as convenient a form as any other is to apply a gutta-percha cover on the tumour, and line it with layers of wadding, which can be gradually increased in number as the tumour yields to pressure.

2. If there are obvious symptoms of general hydrocephalus, no operative measure is admissible.

3. If there be a watery tumour which is rapidly on the increase, without other symptoms, repeated puncture may be tried; all possible precautions against the entrance of air being taken.

4. If this method fails, the injection of iodine may be tried. Those cases appear to be best fitted for this method in which the tumour, as far as can be judged, is free from the presence of cerebral matter, and has a stalk or pedicle.

5. All irritating applications to the skin are worse than useless. They cannot cure the disease, and may easily produce sloughing of the skin, and so burst the tumour and cause death.

6. Finally, there may be cases, however rare, in which the entire removal of the tumour might be contemplated. If the communication with the interior of the skull has become obliterated, the case is converted into one of ordinary cyst, with no more danger, and at the same time no more urgency, about the operation than in common tumours. . . . In other cases, if it be determined to remove a tumour the pedicle of which is believed to have a communication with the cerebral cavity, the best method of operating would perhaps be to provide a clamp with narrow flat blades, something like that which is used by some surgeons in operating for piles. This clamp could be placed on the stalk of the tumour. The cyst could then be tapped, and as the fluid escaped, the blades of the clamp might be tightened, in order, if possible, to bring all parts of the

inner surface of the pedicle into contact with each other. This being done, the tumour should be removed, two small flaps of skin being preserved to cover the opening. These flaps being united carefully (by the continuous suture), the operation would be terminated. The clamp could be removed after a certain time, say twenty-four hours. Its application would be intended to produce such an amount of inflammation and extravasation of lymph as may procure the obliteration of the pedicle, without so much or such long-continued pressure as would cause ulceration of the skin."

The subject of *Spina Bifida* is treated of in Chapter V. Here again the diagnosis is usually easy, yet a girl of seven was admitted into St. George's Hospital with a fatty tumour in the middle line of the lumbar region, which had been permitted to remain till it weighed almost thirteen pounds, under the impression that it was a spina bifida. From congenital cystic tumours which might happen to be developed in the median line of the back, spina bifida could be distinguished by the presence of the spinous processes beneath the tumour in the former class of cases, or if this point could not be determined, possibly by the character of the contained fluid.

"Other congenital spinal tumours (false spina bifida) are hardly to be distinguished from the true type of the disease; but the diagnosis is of little moment, even if removal is in question, for the practical considerations would in both cases be the same."

In a few cases, spina bifida undergoes spontaneous cure, the sac withering away without bursting, while in other instances the patient lives an indefinite time (in one case to the age of 50) without experiencing any particular inconvenience from his deformity.

Our readers will find an interesting case in point in the Proceedings of the Philadelphia Pathological Society for Nov. 14, 1866. (See No. of this Journal for July, 1867, p. 137.) In this instance the patient was thirty-two years old, and is stated by Dr. Wm. Pepper, who observed the case in the Pennsylvania Hospital, to have presented no symptoms referable to his spina bifida, and to have died of an entirely distinct affection.

In most cases, however, the disease proves fatal after a longer or shorter period; and hence, Mr. Holmes differs from those writers who believe that surgical interference is never justifiable in spina bifida.

"I admit this rule as applicable to the great majority of cases, but I hold that some operative measure is indicated (1) in cases in which the integument is very thin or is absent, so that the patient will in all probability soon die from the bursting of the tumour; (2) in cases in which convulsions, depending as far as can be made out on the presence of the tumour, are frequent; and (3) in cases in which paralysis is present, and is not relieved by the mere evacuation of the fluid."

The treatment usually to be recommended is pressure, sometimes preceded by evacuation of the fluid through a simple puncture. Of more active measures the most promising in Mr. Holmes' opinion is the injection of iodine as practised by Dr. Brainard or by M. Velpeau. If excision is to be resorted to, the knife should be used in preference to the ligature, as the obtaining of union by first intention affords the only hope of success.

With regard to the treatment of "false spina bifida," under which name several distinct affections are included (which have in common that they communicate with the cavity of the spinal canal, though not with that of the membranes), the connections of the tumour to the spinal canal and other important parts must be carefully considered. In cases that appear to justify interference, the surgeon may inject iodine, or may pass a small seton through the tumour; should these measures fail, the question of excision may be considered.

The subjects of *hare-lip and other malformations of the face* are discussed in Chapter VI. The ordinary operations for the cure of hare-lip are well described, and we are pleased to observe that Mr. Holmes has not thought it necessary to add any new method of his own invention.¹ In cases of double hare-lip with projection of the intermaxillary bone, the latter should be always preserved if possible.

"In the slighter cases of projection of the intermaxillary bone, it is merely necessary to fracture its attachments to the septum, and to press it back into position; or if it be too large to fit the gap, the exuberant parts must be pared away at the sides. In the latter case it is better also to refresh the sides of the upper jaw-bones."

In cases of greater deformity, Blandin's operation, with or without Bruns' or Laugenbeck's modifications, may be employed. With regard to the use of anæsthetics, Mr. Holmes thinks the danger from blood running into the trachea has been exaggerated; still, as there is no doubt some risk in the use of anæsthetics, and no very great advantage, he does not himself employ them in hare-lip operations. In simple cases, the sooner the deformity is remedied the better; and even in those which are more complicated, the operation should not usually be postponed beyond the age of two months.

Chapter VII. treats of *fissured palate in childhood*, and is characterized by the same tone of practical common sense which is observable in the preceding portions of the volume. If the child is not hindered from taking nourishment by the deformity, Mr. Holmes thinks it better to defer the operation till from the eighth to the twelfth month of life. In any case operated on during infancy, the use of an anæsthetic, and of some such instrument as the gag employed by Mr. T. Smith, is essential.

Chapter VIII. continues the discussion of *deformities of the face*, taking up in succession hypertrophy of the tongue, tongue-tie, and malformations of the ear. A few remarks are also made upon the rarer deformities known as atresia oris, microstoma and macrostoma congenitum, fissure of the lower lip, and fissures and congenital absence of the nose.

Tongue-tie may occasionally require treatment to enable the child to suck: the operation consists in a simple division of the frænum with a pair of blunt-pointed scissors. We have seen a hospital surgeon perform a complicated subcutaneous tenotomy, or rather myotomy, in the submental space, on a child several years of age, with a view of remedying dumbness. This treatment seems to be founded upon an erroneous idea, for, as pointed out by Mr. Holmes in the chapter before us, the power of articulate speech is not lost even after total extirpation of the tongue.

Congenital malformations of the neck are treated of in Chapter IX. In cases of congenital obstruction of the œsophagus, where the deformity is complicated with tracheal fistula, it is probable that life could not be permanently maintained even if the passage of food could be restored, and in such cases, Mr. Holmes thinks no operation should be attempted. Where no such complication exists, however, an operation might be performed, though its success would be very doubtful.

Congenital tracheal fistulæ are best left untreated: for the deformity is slight and easy of concealment, and any operative measures for its cure would be of necessity attended with considerable risk.

Extroversion, or congenital hiatus of the bladder, is considered in Chap.

¹ Among the most ingenious of the "new methods" (though not mentioned by our author) is that recently proposed by Dr. Collis, of the Meath Hospital; see Dublin Quarterly Journal of Medical Science, May, 1868, p. 292.

X. The various operations which have been proposed and practised for the relief of this distressing deformity are described, as well as a new process which Mr. Holmes designs to employ should he again meet with a case which should seem to require it. For the details of this plan, which seems to us both ingenious and promising, we must refer our readers to the volume itself. The palliative or plastic operation, which aims merely at remedying the most painful consequences of the deformity, has been frequently performed and often with very good results. Two coloured plates accompany this chapter, showing the appearances in a case before and after operation.

Chapter XI. is one of very great importance, and one which we wish could be read by every surgeon and physician in our land. The subject is *imperforate anus* and *imperforate rectum*. The different varieties of these malformations are fully described, and the means of treatment appropriate to each clearly indicated. We would gladly make many extracts from this most excellent chapter, but must confine ourselves to the following :—

“The entire absence of the lower bowel, though a most formidable affection, is not absolutely fatal, if treated by an appropriate surgical operation. . . . It is, indeed, argued in some surgical works, that operations in these cases are unjustifiable, for that the condition of a patient with artificial anus is so horrible, and so disgusting to himself and others, that, sooner than place him in such a condition, the surgeon ought to abandon him to death. Now, in the first place, I doubt altogether the morality of this reasoning. I do not think that we have any right to abandon a patient to certain death, if we know of any means likely to save him. . . . This is the case even with patients of mature years, who may possibly be able to judge of the prospect before them, and who have some claim to be allowed to act on their own independent judgment. But what right have we to judge for an infant, who can form no judgment for himself? What right have his parents to condemn him to death, in preference to living with an infirmity which, though perhaps troublesome on account of the attention it may require from them, and possibly disgusting to them from its results, may be to him a matter almost of indifference : at any rate may not preclude him from enjoying many of the comforts and amusements of life, nor even from performing its active duties?”

We may add that when the bowel cannot be reached from the perineum, the proper mode of treatment is to perform colotomy by Littre's method, in which the incision is made in the left groin.

Malformations of the umbilicus and of the *genital organs*, together with *hermaphroditism*, are treated of in Chapter XII. Phimosi, epispadias, and hypospadias are successively considered, and the operations suited for each case well described. Congenital obliteration of the urethra should be treated as impermeable stricture in the adult, and congenital perineal fistula as the same affection when not congenital. Mr. Holmes' remarks upon hermaphroditism are brief, but practical and judicious. He appears not to be acquainted with Prof. Gross's remarkable case published in the *Transactions* of the Kentucky State Medical Society. [See this Journal for Oct. 1852, page 386.] With regard to cases of imperforate hymen or imperforate vagina, Mr. Holmes very properly advises that operative measures should be employed before the commencement of menstruation.

“It is true that the small size of the parts renders the operation more difficult and anatomically more dangerous ; but the latter danger is, I think, outweighed by the far less danger pathologically.”

Chapter XIII. concludes the first part of the volume, and is devoted to a consideration of the malformations of the limbs. Unsymmetrical hypertrophy as a rule calls for amputation in an early stage of the disease. In

symmetrical hypertrophy Mr. Holmes would be disposed to try deligation of the main artery as practised in cases of elephantiasis. For the treatment of webbed fingers, Mr. Barwell's ingenious operation is described and favourably spoken of. In the management of congenital dislocations, extension and instrumental treatment may be employed, with the preliminary use in some cases of tenotomy, as practised by Mr. Brodhurst. [See paper in *St. George's Hosp. Reports*, vol. i., and notice in No. of this Journal for July, 1867, pp. 194-5.]

We have thus concluded our examination of the first portion of Mr. Holmes's work, to which we have devoted more space, proportionally, than can be afforded to the remainder; not that his remarks on the injuries and diseases of childhood are less worthy of attention than his views upon the treatment of their deformities, but that the latter are, perhaps, more perplexing to ordinary practitioners, and have seemed, therefore, to call for more extended consideration.

The first Chapter (XIV.) of the second part treats of *contusions*, of *wounds*, and of *surgical operations*. The administration of anæsthetics is very frequently needful in the treatment of the surgical affections of childhood: should asphyxia come on during the use of the anæsthetic, the tongue must be drawn forwards and artificial respiration at once resorted to. The best method of performing artificial respiration in these cases is, in the opinion of Mr. Holmes (and we entirely agree with him), by simple manipulation of the thoracic walls. Our author's views as to the best means of suppressing hemorrhage coincide so completely with our own that we cannot forbear quoting them in his own words:—

"I confess that I am in favour, as far as present experience goes, of the old method of tying the vessels, over the new one of securing them with needles, in operations on children. The reason of this is the very plain one, that I have never seen any harm whatever from the use of silk ligatures in childhood, nor in the experience I have had (which, I must allow, has been limited) any good whatever from the use of acupressure. It should be remembered that in childhood the vessels are small, and, therefore, the ligatures soon separate. That they strangulate a small portion of tissue, and in most cases cause that small portion to slough, is true enough; but any one who will be at the trouble of examining the matter which comes away in the noose will see how small that portion is; and I am confident that any one who will watch the progress of an ordinary amputation in childhood, will soon come to the conclusion that any effect which such sloughing may have on the general system (if, indeed, it has any effect at all) has been very grossly exaggerated. If the ultimate advantage derived from the use of acupressure is to obviate the secondary complications of wounds, I may say with truth that almost every case which I can remember as dying after operation from any such complications, has been in excisions where no ligatures have been used, but where large sections of bone have been left exposed in suppurating cavities. On the other hand, the use of the requisite number of ligatures in amputations or operations for the removal of tumours has never, so far as I have seen, prevented the rapid union of the wound; and in amputation quite sufficient primary union will be secured to maintain the rounded shape of the stump. For these reasons, I am skeptical of the great advantages to be derived from acupressure—at least in children's surgery; whilst I regard any complication in the dressing of the wound as a positive and great evil. Now, although it is true that the withdrawal of acupressure-needles is often painless, it is not always so. If any large number of needles has been used, the flaps must be adjusted after their removal. All this complicates the proceeding, and occasions the child pain and fright, for the problematical advantage of avoiding the formation of a few drops of pus."

Fractures and dislocations, and *ruptures of the viscera* are considered in Chap. XV. With regard to fractures of the clavicle, Mr. Holmes says:—

"I have seen several cases in which no deformity existed from the first, and which, of course, recovered without any particular trace of the injury; but I cannot honestly say that I have ever noticed one in which surgical treatment proved successful in removing deformity. The lump which follows immediately on the consolidation of the fracture will become less perceptible with time; but if any considerable displacement exists at first, I do not think any treatment will succeed in removing it."

In cases of compound fracture of the elbow, Mr. Holmes recommends excision as the general rule of practice. Separation of the upper epiphysis of the tibia must be a very rare accident, for our author has never met with such a case, and knows of but one which has been reported—that stated by Madame Lachapelle to have occurred during delivery. [*Packard's Malgaigne*, p. 70.] A very well-marked case of this injury came under our care at the Episcopal Hospital during our last term of service. The patient was a boy, eleven years of age, who had been hurt by being caught between the bumpers of railway cars. The injury was accompanied by such frightful laceration of all the soft tissues as to require amputation in the lower third of the thigh. The nature of the lesion was thus verified by dissection, and the specimen is preserved in the hospital museum.

Mr. Holmes reprobates, and we think very properly, the practice of treating fractures of the lower extremity in children without apparatus. A plan of treating fractures of the leg in infants, which we have found to answer admirably during the acute stage of the injury, is to envelope the whole limb in a soft pillow, which is secured by the firm application of a roller bandage. This effectually prevents any harm from being inflicted by the child's restlessness, which cannot be prevented, and is not attended with the risks which are so apt to accompany the use of any immovable apparatus.

Chap. XVI., on *burns and scalds*, is interesting, and contains much of practical importance. We would especially invite the attention of our readers to Mr. Holmes's remarks upon the treatment of contracted cicatrices.

Foreign bodies in the nose, ear, fauces, œsophagus, and stomach are treated of in Chapter XVII. A practical remark as to the treatment to be adopted in cases where foreign bodies have been swallowed, is of importance. Such food should be given as would rather retard than hasten the action of the bowels, so that the foreign body may be surrounded with a considerable mass of feces. The use of purgatives should be avoided, but if the case should be seen sufficiently soon, an emetic might possibly dislodge the foreign body before it had reached the intestine.

In Chapter XVIII. *injuries and foreign bodies in the trachea, tracheotomy, and the various causes requiring this operation in childhood* are discussed. In cases of scalds and burns, tracheotomy should be delayed as long as possible; for where the dyspnœa depends on lesion of the parts in immediate proximity to the glottis, much success cannot be hoped for under any circumstances, while if it be purely spasmodic, it can probably be relieved by milder measures. Mr. Holmes's remarks on fracture and rupture of the trachea are principally founded on Dr. Hunt's valuable paper, published in the number of this Journal for April, 1866. [pages 378-383.] An interesting case of this injury, which has apparently escaped the attention of both gentlemen, may be found in *Lonsdale's Treatise on Fractures*, page 239.

This chapter is quite elaborate and of much importance; it contains a table giving the details of twenty-eight cases of tumour of the larynx, derived from the Transactions of the Pathological Society.

In the last volume of *St. Bartholomew's Hospital Reports* was published an excellent paper by Mr. Marsh, which recommended *tracheotomy*

as always preferable to *laryngotomy*. [See notice in number of this Journal for July, 1868, pages 223-4.] In this recommendation, Mr. Holmes does not coincide; and we must say, that he advances many cogent reasons why the operation through the larynx should be adopted, at least in cases of children. This chapter, which completes the second part, is by no means the least valuable of the volume.

The *morbid diatheses of childhood, cancer, struma, rickets, syphilis*, are treated of in Chapter XIX. :—

"I have often," says Mr. Holmes, "seen much difficulty in establishing a diagnosis between *ostitis* and malignant disease. and have known at least three cases in which amputation at the hip-joint has been contemplated for an affection of the femur, which turned out afterwards to be of a simple inflammatory nature. All these patients were children; one of them, however, near the age of puberty."

We may add, that we have known a similar mistake to be made in cases of adults, where, perhaps, it was even less excusable than where the patient had not passed the age of childhood.

"But, one practical consideration must occur to the mind of any one charged with the responsibility of a case of this kind, viz., that no operation (and especially none of so formidable a nature as amputation at the hip) ought to be proposed while any doubt whatever rests on the diagnosis. If the case is one really of cancer, the operation is, at the best, of doubtful value; if it be *ostitis*, it is worse than superfluous."

Mr. Holmes's remarks upon the relationship and yet difference between tubercle and scrofula, and between the latter and syphilis, are full of interest, and eminently judicious and practical. *Struma* is a general term which may be conveniently retained, being understood to embrace three distinct though analogous classes of cases. These are the tuberculous, the scrofulous, and a third class of cases "in which there is not only no tendency to tubercle, but no real constitutional affection whatever, which are merely examples of chronic inflammation set up by local causes."

The general treatment of all these cases consists principally in the adoption of the hygienic measures which all surgeons agree in recommending. With regard to the local treatment, we quote the following :—

"To all" (the three sets of cases above referred to) "the same general principle of palliative treatment is applicable: never to be in any hurry, and never to apply any operative treatment, even so much as a simple incision, without obvious necessity. The diseases in all the three classes of cases are chronic, and nothing seems to me more absurd, and more contrary to all sound principles of surgery, than to convert a chronic disease into an acute one unnecessarily by operative interference."

Where, however, an operation appears unavoidable, the distinction of the three classes above indicated becomes very important for prognosis. In cases where there is evidence of tubercle, operative measures are generally not desirable; and even if they should be demanded to relieve the local suffering, the prognosis must of necessity be very guarded. In the other two classes, on the contrary, operative treatment may be expected to be followed by the most happy results. The liability of prolonged suppuration and confinement to induce the deposit of tubercle must be also borne in mind, as well as the fact that suppuration of itself, if long continued, is now known to be a cause of visceral degeneration, the so-called waxy or amyloid, or, as Dr. Dickinson has termed it, depurative degeneration of the liver and kidneys. [See number of this Journal for April, 1868, pp. 467 and 491.]

Mr. Holmes's remarks on rickets and on infantile syphilis are well worthy of attention; but we must pass on to other matters, merely stating that our author is decidedly in favour of employing mechanical support and pressure in the early stages of rickets, believing that thus if deformity cannot be removed, it can at least be prevented from increasing.

Chapter XX. is devoted to the consideration of *gangrene in childhood*. The parts usually affected are the mouth and cheek, and the female genital organs, constituting thus the diseases known respectively as *cancrum oris* and *noma pudendi*.

A disputed point is, as to the influence of mercury in causing *cancrum oris*. Mr. Cooper Forster believes the use of that drug to have a decided causal relationship to the disease. Dr. West, on the other hand, looks upon the coincidence as purely accidental. Mr. Holmes believes "that as far as mercury acts as a depressing agent, it may indirectly occasion the complaint; but that the proof of its direct action, by producing inflammation and ulceration of the mouth, leading to gangrene, is hardly complete."

The symptoms and course of the disease are well described, and the opinion expressed, that if the disease could be recognized and properly treated in its earliest stages, it would be found less fatal than it now appears to be. The best local remedy, Mr. Holmes believes to be the strong nitric acid, which must be thoroughly applied to every part of the diseased surface, the child, of course, being in a state of anæsthesia. In some cases it may be necessary to apply the acid more than once. The child must be frequently supplied with food and stimulus; and Mr. Holmes is in the habit of administering the chlorate of potassa, though he has never convinced himself that it has any influence on the progress of the disease.

Noma pudendi, if extensive, is a very fatal disease, and sudden death sometimes occurs even when all danger seems to have passed by. The treatment is similar to that employed for the affection of the mouth.

In Chapter XXI., on *tumours in childhood*, are given the histories of three cases of considerable interest, which show the ease with which large tumours may be removed at an early age, and likewise illustrate the importance of removing morbid growths before they have attained large size and have acquired deep connections. One hint of practical importance is, that while skin which is merely overstretched by the increase of a tumour, should be allowed to remain, the case is different with congenital growths, for here there has been originally more skin than is required by the natural size and shape of the parts, and hence, in such cases, less unsightly scars will be obtained by removing the superfluous tissue.

Chapter XXII., on *diseases of bone*, treats of diffuse or acute periostitis (acute periosteal abscess), acute necrosis, osteomyelitis, osteitis, caries, and necrosis, with remarks on the operations known respectively as subperiosteal resection, and gouging (*évidement des os*). We have so recently gone over the subject of bone pathology in our review of M. Ollier's elaborate treatise [see number of this Journal for January, 1868, pp. 140-165], that we shall not dwell on this portion of the volume, further than to state that it is marked by the same clearness of expression and good, practical common sense, which characterize all of our author's writings. The coloured plate that adorns this chapter we recognize as an old friend, it having already done service in one of Mr. Holmes's papers, in the first volume of St. George's Hospital Reports.

Diseases of the joints are considered in Chapter XXIII., which is well worthy of careful study on the part of every practising surgeon. Mr. Holmes doubts, and we think with reason, the advantages supposed to be

derived from the refinements of pathological anatomy in endeavouring to fix the exact tissue which in any particular case of joint disease is primarily involved. For, in fact, it is generally impossible in practice to make these exact distinctions, most cases exhibiting a simultaneous affection of more than one of the joint tissues, and it not being by any means certain that the part which first manifests a morbid condition has been actually the first to become diseased. Mr. H. generally approves the practice of freely opening joints when affected with acute abscess, at least in cases of children.

"It should not be forgotten, however, that incisions, if they do no good, will certainly do harm. I think every surgeon must have seen, and seen with regret, in adults, the profound and rapid exhaustion which often follows the free incision of the knee-joint, and how frequently amputation is resorted to afterwards when the patient is sinking and when the operation hardly can succeed, while if the limb had been removed in the beginning, the patient would have had, at any rate, a fair prospect of the preservation of his life."

Acute disease of the knee-joint often demands amputation, which, in these cases, Mr. Holmes thinks preferable to excision. In the elbow, on the contrary, excision is a very promising mode of treatment. Acute abscess of the hip and shoulder scarcely admits of any treatment beyond free incision. In the former case the danger to life is very great, but in the shoulder recovery may be usually anticipated, though loss of motion is almost inevitable.

"Operations in chronic joint-disease would be hardly ever necessary but for the neglect with which this class of diseases is generally treated."

To the truth of this aphorism we most cordially subscribe. We believe that there is scarcely any class of cases in the management of which so much carelessness and ignorance are shown by ordinarily good surgeons, as in chronic joint affections. Again and again have we known nurses or parents told to "hang a weight to the child's foot," in cases of hip-disease, and this thought all-sufficient as a means of treatment. What is the result? Even supposing the child does not elude the applied extension by slipping down in bed till the weight rests on the floor, the diseased joint is not kept at rest, for he will sit up in bed or turn on his side, and the great object of treatment is at once defeated. Mr. Syme's dogma, referred to by our author, that the reason excision of the hip is more common in England than in Scotland, is that in the latter country they treat hip-disease with the long splint, has in it this much truth, that the long splint, properly adjusted, necessitates perfect rest of the hip-joint, which no other means of treatment that we know of, unless Physick's carved splint (see number of this Journal, Feb. 1831), or some modification of the same, can do. Not but that the weight and sand-bags, or other mode of extension, will produce the same effect, if the patient can be induced to keep still, but this, even in the most tractable children, can often not be obtained. Hence, we not unfrequently superadd the long splint to the ordinary extending apparatus, with the most satisfactory results.

With the following remarks of Mr. Holmes we entirely agree :—

"I have no hesitation in saying that we constantly see limbs sacrificed in consequence of the neglect of the surgeon who was first called in, and who has not followed the plain rule of surgery, to provide the joint with mechanical support, and keep it at absolute rest. I think it beyond question, that if every strumous joint were to be put up in well-fitting splints when first seen, and the splints kept on constantly, we should see far fewer cripples about our streets, and find our experience in excision of the knee and hip materially curtailed."

Hip-disease and excision of the hip are treated of in Chapter XXIV.

The pathological anatomy and the symptoms of the disease are discussed, and the fact stated, that while true consecutive dislocation does occasionally occur, the deformity is generally due to an enlargement of the acetabulum, with which the head of the femur still remains in contact. The diagnostic marks of the affection are well indicated, and the mode of treatment by the weight and pulley clearly described. As we have said above, we have found advantage from the combination of this apparatus with the long splint.

Forceful straightening of the limb, under chloroform, as recommended by Bonnet, of Lyons, is advised in cases of deformity. Mr. Holmes has occasionally performed tenotomy in these cases, without, so far as he knows, either good or bad result. In cases of caries, the question of excision or amputation is presented, and upon this point our author speaks with authority, having apparently excised the hip-joint more frequently than any other surgeon, living or deceased. As we hope before long to present to the profession our own views upon this subject, in another form, we shall not dwell upon this chapter further than to commend it to the careful attention of our readers.

Chapter XXV. treats of *excision of the knee*. This operation Mr. Holmes believes to be more fatal than amputation. Without entering upon this point, we will observe that it is very unfair to compare excisions of the knee with thigh amputations, without regard to the point of operation. Amputation of the thigh, in general terms, is a very dangerous proceeding; but amputation at the knee-joint (which is much more comparable with excision) presents, when practised for disease, the comparatively small mortality of 24 per cent., and Mr. Carden's sixteen cases of amputation for disease of the joint, through the condyles of the femur, were uniformly successful [see Dr. Brinton's paper in number of this Journal for April, 1868, pages 328 and 332]. On the other hand, 113 cases of excision of the knee, collected by Mr. Butcher, give a mortality of over 27 per cent., though of course, in many of these cases, the deaths were from causes unconnected with the operation employed. Mr. Holmes is by no means an enemy of excision, but recommends it and practises it in all cases where he thinks it offers a reasonable prospect of success. Arrest of growth does undoubtedly sometimes follow the operation, but it need not be much dreaded, provided the bone section is kept within the limits of the epiphysis. The operation is not to be forbidden in childhood, but Mr. Holmes thinks it promises best in patients about fourteen years of age. In general terms, excision is most applicable for the most favourable cases, and when it does succeed, its results are beyond all comparison superior to those of amputation. In the after-treatment of cases of excision, Mr. Holmes usually prefers the straight tin or iron splint recommended by the late Mr. Price.

The two next chapters deal respectively with *excisions in the foot and in the upper extremity*. These are both interesting, and the first appears to us especially valuable. Mr. Holmes has repeatedly excised the calcaneum, and in several cases the astragalus and other tarsal bones. We have, as yet, much to learn as to the application of conservative surgery to the foot, and we hail Mr. Holmes's teachings as powerful and well-directed efforts in the right direction. We think, however, that he scarcely does justice to the sub-periosteal method of M. Ollier; we confess that we have not, as yet, met with the brilliant results spoken of by the French surgeon, yet we should think it right to endeavour to preserve as much periosteum as possible in every excision we should be called upon to perform. In the second chapter is given a most interesting case of successful excision of both elbow-joints in a child five years of age.

Chapter XXVIII. treats of *amputation in childhood*, and is eminently practical and judicious; as, however, its most interesting points have been previously discussed in the author's papers in the first volume of *St. George's Hospital Reports*, we would refer our readers to our review of that work in the number of this Journal for July, 1867, pp. 192 and 197.

Chapter XXIX. is devoted to the consideration of *diseases of the spine*. We quote Mr. Holmes's opinion as to the treatment of psoas abscess, which seems to us entirely correct.

"With regard to opening abscesses connected with spinal disease, my own experience leads me to dissuade it. However effected, and with whatever precautions, I think it generally does more harm than good."

In some cases it may be proper to open a spinal abscess while still in the iliac fossa behind the peritoneum, and in any case where it is decided to operate, it may be advantageously done, as suggested by Prof. Lister, under the local application of carbolic acid.

Chapter XXX. treats of *diseases of the mouth*. It may occasionally become necessary to remove enlarged tonsils, though in the large majority of cases medical treatment is sufficient. The operation may be performed with hooked forceps and with bistoury, or with Charrière's, a modification of Fahnstock's, guillotine (see No. of this Journal for Nov. 1832, p. 249); or in some cases caustic potassa may be applied, as recently recommended by Mr. W. J. Smith.

Affections of the intestines are the subject of Chapter XXXI. For the patency of the umbilical ring which is so common in infancy, and which, if neglected, gives rise to umbilical hernia, Mr. Holmes recommends the application of a flattened pad, kept on by strapping or by an elastic band. The plan which we learnt from our preceptor, Prof. Carson, of the University of Pennsylvania, and which has always proved satisfactory in our hands, is to apply a simple strip of adhesive plaster about four inches long by one inch and a half wide, so as to approximate the edges of the ring and keep them in place. This strip may be renewed as often as it becomes detached by washing, and in the course of a few weeks has never failed in our hands to effect closure of the ring.

Our author does not recommend any operation for the so-called radical cure of hernia, preferring to rely upon instrumental support, which, in children, often suffices to effect a cure. One very strong argument, we have always thought, against the adoption of any operation for the radical cure, is based upon the fact that in many, if not in all cases of hernia, there is a positive abnormal elongation of the mesentery, a condition which, of course, cannot be remedied by any operative measure. [See Mr. Birkett's essay in *Holmes's System of Surgery*, vol. iv. p. 230, and reviewed in number of this Journal for April, 1865, p. 428.] This chapter is adorned with two coloured plates, representing a rare case of congenital vaginal hernia, before and after operation.

The next two chapters treat respectively of *diseases of the rectum*, and of *diseases of the bladder*. They are both excellent, and full of useful practical information. With regard to the medical treatment of enuresis, we may mention that we have heard of one most obstinate case, which finally yielded to the hypodermic administration of atropia; the use of belladonna, by the mouth, having previously failed.

Chapter XXXIV. is on *stone in the bladder*. "I do not," says Mr. Holmes, "fear the imputation of clinging to old fashions when I avow my strong conviction that in children (by which I mean in males below fifteen) there is no method so safe and so efficient as lateral lithotomy."

A very common fault in operating is thus referred to :—

“There seems an idea in the minds of some surgeons that there should be something unusual about the first incision, that it is necessary to stab the point of the knife deeply into the perinæum at first starting. But this is certainly not necessary, and I do not think very safe. The point at which the groove of the staff is to be opened is at no great depth, far less than is ordinarily reached in the extraction of a tumour; the time required to cut down to this depth in the usual manner is quite insignificant, so that there is no reason for making a stab wildly into the tissues of the perinæum, instead of cutting through them in an orderly manner, and feeling from time to time for the staff.”

We are glad to observe that Mr. Holmes directs that, in introducing the left forefinger into the bladder, it should be passed *between the upper edge of the staff and the pubis*. We believe that it is to a neglect of this precaution that a failure to enter the bladder is generally due. A rule that we have always followed in the operation of lithotomy, and which we think a very good rule where practicable, is not to withdraw the staff till the finger touches the stone, and then not to withdraw the finger till the forceps are fairly introduced; in fact, having once reached the stone, never to lose control of it till it has been extracted. Of course, there are some cases which defy the efforts of the most skilful surgeons, but we are convinced that the large majority of failures in lithotomy are from carelessness.

“As to the median operation (Allarton’s, as it is usually, though not very correctly, called), I have but little experience, and cannot say that I wish to extend it. The median operation appears to me in all respects inferior to the lateral.”

We quite agree with our author in his condemnation of the various complicated instruments which have been devised with the intention of facilitating the operation of lithotomy; a good surgeon has no need of them, and others had better follow the rule of the Hippocratic oath, and “not cut persons labouring under the stone, but leave this to be done by men who are practitioners of this work.”

The remaining chapters of Mr. Holmes’s work treat respectively of the diseases of the male and of the female generative organs, and of enlarged glands. His remarks upon each of these subjects are worthy of attention; but we have already occupied so much space that we must bring our review to a close. The volume is terminated with a sufficiently full index.

Mr. Holmes’s book is, so far as we know, the first attempt to supply a complete and systematic treatise on the subject of the “surgical treatment of children’s diseases.” Hence, in reviewing it, we have not the advantage of being able to compare it with the productions of other authors. We have, therefore, preferred to give our readers an analysis of Mr. Holmes’s views upon the various branches of his subject, rather than to indulge in criticism upon those views; though, to tell the truth, his opinions so generally coincide with our own, that in most instances our criticism, if we should offer it, would tend to degenerate into eulogy rather than into contradiction.

The highest praise we can give the work (and we give it most heartily and conscientiously) is to express a wish that Mr. Holmes’s volume might be republished in this country, and introduced as a text-book into every medical school in our land. It is the only special treatise attainable upon a most important subject, and we venture to predict that it will be many years before it will have a rival, at least in our own language.

The Messrs. Longman have done their part as publishers, in a manner worthy of the highest commendation.

J. A., JR.

ANALYTICAL AND BIBLIOGRAPHICAL NOTICES.

ART. XVII.—*Guy's Hospital Reports*. Edited by C. HILTON FAGGE, M. D., and ARTHUR E. DURHAM. Third Series, Vol. XIII. 8vo. pp. xvi., 538. London: John Churchill & Sons, 1868.

THE present volume of this most valuable series contains twenty-two papers, and is adorned with eleven plates (two of them coloured), and one wood-cut. We propose to furnish our readers, as usual, with a brief analytical and critical notice of the various papers embraced in the volume before us, grouping together first those of especial interest to surgeons, and secondly such as refer more particularly to practical medicine.

I. *A Second Case of Pharyngotomy for the Removal of a Foreign Body Impacted in the Pharynx*. By EDWARD COCK.

The patient was a soldier, who, while asleep, swallowed a tooth-plate which he had been in the habit of wearing, though it had lost the artificial teeth which had been originally attached to it. The size of the plate, as shown by the wood-cut, appears to have been an inch and a half by about three-fourths of an inch. Its material was silver. The accident occurred during the night of June 29th–30th, and after several ineffectual attempts to remove the foreign body had been made by the regimental surgeon, the patient left the camp and came to London. Here he applied to Mr. Cock, who immediately sent him to Guy's Hospital, where he was admitted on the afternoon of July 2d. As he had taken no food for more than seventy hours, Mr. Cock passed a large flexible catheter down the œsophagus by the side of the plate, and was thus enabled to introduce a few ounces of milk into the patient's stomach. The operation of pharyngotomy was performed the next day. The various steps of the operation are clearly described. The after-treatment consisted principally in the administration of food, which was accomplished by means of the stomach tube, assisted by nutrient enemata. In the present case, the operation entailed no loss of voice upon the patient; this Mr. Cock attributes to his having opened the pharynx as far back as possible, thus avoiding, as he believes, all filaments of the recurrent laryngeal nerve. We would refer our readers to the excellent notice of Mr. Cock's first case of pharyngotomy, to be found in the review of vol. iv. of *Guy's Hospital Reports* (1858), in the number of this Journal for April, 1859. We may add that in the criticisms there made we entirely coincide.

II. *Clinical Lectures Delivered at Guy's Hospital during the Winter Session, 1866–67*. By JOHN HILTON, F. R. S.

This paper is of the greatest interest and practical value; it embraces reports of five lectures, which we propose to examine somewhat in detail.

The first lecture gives the history of a fatal case of rupture of the left kidney, attended with hæmaturia. Following the daily report of the progress of the case we have Mr. Hilton's comments, in which he recapitulates the symptoms, shows how the diagnosis was arrived at by exclusion, and gives the reason for the adoption of each portion of the treatment. Some most important remarks are added upon the *diagnostic value of clots of blood*. "Most surgeons," says Mr. Hilton "throw away any clot that may happen to come from the invalid; but I would suggest to you never to do so until you have thoroughly examined it. Even if there is only one single confused mass, like that blocking the eye of the catheter in our present case, I advise you to swim it out in water; the shape that it then assumes may be of great help towards your diagnosis, for it will most likely exhibit the well-known form of the space that contained it during its coagulation." In the case in question, some of the clots had been evidently

formed in the pelvis of the kidney, while others had derived their shape from coagulation in the ureter.

In the second lecture the subject of the diagnostic indications afforded by blood is continued, in the instances respectively of hemorrhage from the urethra, the rectum, and the stomach. If in attempting to micturate, blood escapes *before* any water passes, the hemorrhage is from the urethra, since blood never, or at least very rarely, flows backwards into the bladder. The exceptions are in cases of disease of the third lobe of the prostate, of false passages penetrating to the bladder, or of paralysis of the bladder and urethra, when the latter acts as a dead tube merely, and there is of course no impediment to the retrogression of at least a portion of whatever blood may be effused.

By applying the same rule as to the examination of clots, much useful information may be derived in cases of hemorrhage from the rectum. *Vomiting of blood* does not necessarily imply any lesion of the stomach. Blood is of itself, an emetic; and hence after any operation or injury in which blood is swallowed, hæmatemesis is likely to occur.

The subject of clots is continued in lecture third, and the proposition is stated that "*a clot of blood destined to arrest hemorrhage may endanger life.*" Several apposite cases are narrated in illustration of this aphorism, of which we will quote but one: "A surgeon opened a carbuncle freely in the afternoon, and ordered the nurse to apply a warm poultice, taking care not to remove any clots of blood, as they would prevent more bleeding, adding that he would call again next morning. On going next day to the house he found the shutters all closed, and his patient a corpse. The nurse informed him that 'the carbuncle bled after he left the house, forming large clots on poor master's back, which increased in size in the night, and he died this morning about four o'clock.'"

On the other hand, *a clot of blood may save life* by plugging wounded blood-vessels, and if the surgeon find that in any case the hemorrhage has positively ceased, he should be very cautious about disturbing the clot, which in this instance has served a good purpose.

Finally, "*a clot of blood may interfere with the success of a surgical operation, by preventing the union of wounds.*" Hence if primary union of a wound is aimed at, all bleeding must be arrested before the wound is closed.

Leaving the subject of clots, Mr. Hilton takes the history of a case of simple fracture of the tibia, complicated with the existence of a *loose cartilage* in the knee-joint of the affected side. The plan recommended for the treatment of this troublesome complaint is to keep the knee-joint constantly straight by means of a back-splint or other apparatus, and to endeavour to fix the floating body in one position in contact with the synovial membrane, by adhesive strips or some similar contrivance. By this plan Mr. Hilton has several times been able to obtain gradual absorption of the foreign body, and his method has at least the great advantage of perfect safety to the patient.

Three cases are embraced in lecture fourth; one of extraneous bodies floating in the thecæ connected with the tendons of the fingers, one of a long-standing ulcer on a stump cured by rest, and one of arrest of repair in a stump, benefit being obtained from division of surrounding nervous filaments.

The first case Mr. Hilton uses with his customary skill for the purpose of warning his hearers not to interfere with thecæ of tendons, or with bursæ situate close to, and especially if communicating with joints, unless other methods of treatment have already failed. Our author makes no reference to the treatment of such cases by injections of tincture of iodine, as successfully practised by the lamented Velpéau. (See notice in number of this Journal for October, 1867, page 514.)

Two cases are given in lecture five: the first of simple fracture of the femur, with extensive laceration of the integument followed by tetanus, the case recovering; and the second of lacerated wound over the knee, suppuration occurring in the joint, and the femur and tibia becoming ankylosed in a good position. Mr. Hilton's remarks upon these cases are characterized by the same judicious reasoning and practical common sense which are so obvious in all his published clinical lectures.

We consider the lectures which we have just had under review to be models

of their kind, and could wish that all gentlemen who hold posts as clinical teachers would recognize that the duty of a bedside lecturer is not to prove his theories of pathology by the exhibition of picked cases, nor, on the other hand, to show a mere succession of isolated cases of greater or less intrinsic interest, but to teach his hearers how to study and reason out their cases for themselves; not making facts mere illustrations of theory, nor yet forgetting that bare facts are almost sure to be either forgotten or misinterpreted.

IV. *On Acupressure.* By J. COOPER FORSTER.

This is an interesting paper, adorned with a lithographic plate, and gives the details of thirty-one cases (mostly amputations) where bleeding was controlled in one or other of the various plans recommended by Sir James Y. Simpson and his followers. The method preferred by Mr. Forster is essentially the fourth method of the Edinburgh professor, substituting, however, a "well-waxed silk ligature or fishing gut" for the flexible wire used by Simpson. We have not found any facts or arguments in Mr. Forster's paper which throw additional light upon the acupressure controversy, and we see no reason to alter the opinion we expressed in noticing the essay of Prof. Pirrie and Dr. Keith in the number of this Journal for July, 1867. We greatly doubt whether the volumes of *Guy's Hospital Reports* which may be published fifteen or twenty years hence will confirm the praise given to acupressure by Mr. Forster in the following words, with which he concludes his paper: "For my own part I have quite decided in its favour (for the reasons I have given), and never intend again to use a ligature in any case where the edges of a wound are brought in apposition with a view to their adhesion. That some more simple plan than that of the pin and wire may be substituted I fully believe, and shall be most happy to cast them aside, as I now do the ligature, when such contrivance shall have been suggested; until that time arrives I shall continue to use acupressure as at present applied, in lieu of the ordinary ligature, with the same feeling that prompted the use of that means of arresting hemorrhage, instead of the hot iron, for I consider it as great an advance on the ligature as the ligature on the cautery."

V. *Report of Forty-one Cases of Uterine Polypi, with Remarks.* By J. BRAXTON HICKS, M. D., F. R. S.

These polypi were of various kinds and of different sizes. "They have, however, this in common, namely, that they were all treated by the plan of immediate separation, and all removed by the annealed steel wire rope *écraseur*, described by me in these reports in 1861, and in the *Obst. Trans.*, London, 1862. They also have these points in common, as regards the results, that no death occurred, and the removal was not followed by hemorrhage, nor by symptoms which gave any anxiety, excepting in two instances."

Dr. Hicks's remarks upon the treatment of this troublesome class of affections are lucid, and, we think, judicious. A careful study of the appended cases will be of service to any who are interested in this important department of uterine surgery.

VI. *Observations on some of the Affections classed as Nervous Deafness.* By JAMES HINTON.

This is a valuable paper, giving details of twenty-three cases. With regard to the signs by which any particular case of deafness may be inferred to depend upon an affection of the nervous system, we find the following remarks:—

"1. The history. This is, in many cases, of itself decisive, especially when it connects the defect of hearing with other nervous derangements. . . . The history, however, may be very misleading if too much relied upon; some of the most marked forms of nervous deafness, especially those of sudden origin, being liable to be closely simulated by simple mechanical obstructions. Among the most frequent causes of nerve-deafness, besides blows on the head, and the effect of extremely loud or long-continued noises, are fever, sunstroke, mumps, diphtheria, parturition, prolonged residence in India. Convulsions in childhood stand as the origin of many cases, but it is a question whether, in a large proportion of these, the convulsive seizures have not been an effect of the ear-disease.

"2. Certain peculiarities of the hearing, such as the hearing better in a noise

(as when riding), or hearing worse on excitement, depression, or fatigue, or on any special attempt to listen. A much better hearing for some sounds than for others, as, for example, for the watch as compared with the voice, is a suspicious circumstance; so also is a great diminution of the hearing on inflating the tympanum. . . .

"3. A certain value attaches to the degree of deafness, which, if it be very excessive cannot depend on absence of conduction; but it is difficult to draw the line. It seems certain that *disease* of the conducting apparatus may reduce the hearing to a lower pitch than its congenital absence necessarily involves.

"4. Certain tests can be applied to the hearing by means of a tuning-fork placed on the head, which will sometimes give almost or quite decisive information.

. . . . An inability to hear vibrations thus imparted to the cranial bones may be fairly held a suspicious circumstance, and at least the converse may be held valid, that if the tuning-fork be well heard, the deafness is not likely to be nervous. But the chief use of the tuning-fork in diagnosis rests on the simple fact that its vibrations, when imparted to the bones, *pass outwards* freely through the tympanum and external meatus, and are therefore reinforced by reflection when either the tympanum or the meatus is rendered impervious to sound. . .

. . . It may, indeed, be laid down as fairly ascertained that whatever diminishes the permeability of the tympanum or meatus for sonorous vibrations causes the bone-conducted sounds to be, *cæteris paribus*, better heard." If the tuning-fork applied to the cranial bones is heard *best*, therefore, with the *deaf* ear, the disease is seated in the conducting media; if, on the other hand, it is heard *worst* with the deaf ear, the case is one of nervous deafness.

Mr. Hinton further states that there is a certain aspect or manner about patients afflicted with nervous deafness which is of value in a diagnostic point of view. As, however, it is too variable as well as too delicate to be defined in words, we must be content to leave it as he does, undescribed.

"The disease from which it is most difficult to distinguish a nerve-deafness is undoubtedly 'ankylosis,' bony or membranous, of the stapes; or it is, perhaps, better to say rigidity of the ossicula resulting from any cause which does not leave palpable marks of its presence on the membrana tympani. It is in cases of this kind that the tuning-fork is so useful. Whatsoever condition of the tympanum prevents the inward, surely prevents also the outward, passage of vibrations, and will therefore, in like manner, prevent the increase of sound on closing the meatus, which depends on this outward passage. If, therefore, we suspect ankylosis in any case, but find that the natural increase of sound ensues on closing the meatus, the strong probability is that ankylosis is not present. If no effect follows, there is most probably obstruction to the passage of vibrations through the tympanum, though this, as will be seen hereafter, is not quite certain; and it then remains for judgment whether there be, besides such obstruction, any implication of the nervous system."

IX. *A Case of Intestinal Obstruction in which the Operation of Colotomy was performed, and twice repeated.* By JOHN HILTON, F.R.S.

This was a very remarkable case. The patient was himself a medical man, and had suffered from abdominal pain and constipation for some time before the obstruction to defecation became complete. After twenty-eight days Mr. Hilton saw him in consultation with Mr. Hancock and the late Dr. Jeaffreson, and they decided that the disease was in the upper part of the rectum or the sigmoid flexure, and that the colon should be opened in the left loin. Four days after the operation, evacuations began to pass *per anum*, and so continued for eleven weeks, the wound of colotomy having in the meanwhile closed. At the expiration of this time "all the worst symptoms returned without there having been any apparent cause for this unfavourable change." The colon was now reopened, a proceeding which was greatly facilitated by the adhesion of the bowel to the cicatrix of the former operation. As on the previous occasion, the bowels were relieved in the natural way on the third day. Great efforts were used to prevent the artificial opening from closing as it had previously done, but without avail; and in about three months the wound had for the second time healed. This time the patient's condition was so much improved that he was enabled to resume his practice, visiting as many as thirty families in the day. After a while,

however, his strength began to fail; he became emaciated, and it was evident that deep-seated suppuration was taking place. From this period the patient's condition gradually became worse. The symptoms of obstruction returned, and it became necessary to perform colotomy for the third time. A large abscess was also opened below Poupart's ligament. The patient died from exhaustion almost a month subsequently. A *post-mortem* examination showed that the original disease had been an annular stricture of the gut about nine inches above the *sphincter ani*. This stricture was not, however, the immediate cause of the obstruction, for it readily permitted the passage of the finger. "The colon above the stricture was found to be bent upon itself, and thus to dip down into the pelvis. . . . It seems to me that the course of events was as follows: The stricture first interfered with the passage of the motions and caused the contents of the intestine to accumulate behind it. The bowel above consequently deviated more and more from its natural position, and became bent on itself until it formed a sharp angle, which prevented entirely the discharge of its contents. When, however, the bowel had been opened by operation its distension was at once relieved, and it then became possible for the feces to pass on towards the anus. Thus the evacuations were discharged in the natural way so long as the wound remained open. When this closed, the same series of events was repeated."

The stricture was of a non-malignant character. It contained no new tissue-elements, but "appeared to be made up simply of the circular non-striated muscular fibres of the intestine, aggregated together, so as to form a cord-like mass."

This paper is illustrated with a lithographic plate.

XIV. *Case of Excision of the Spleen for an Enlargement of the Organ, attended with Leucocythæmia; with Remarks.* By THOMAS BRYANT.

The patient was a woman, forty years old, who had been obliged to leave her situation as housemaid on account of increasing debility, about six weeks before the date of the operation. The excision of the spleen was not attended with any difficulty, but the patient died from hemorrhage within fifteen minutes from the time of her removal from the operating table. In Mr. Bryant's previous case, it will be remembered, the patient did not bleed to death for two hours. [See notice in No. of this Journal for April, 1867, page 494.]

In both cases the majority of the glands throughout the body were affected in a manner similar to that which characterized the spleen.

"We have thus learnt," says Mr. Bryant, "two things from the cases related.

"Firstly, that the enlargement of the spleen in leucocythæmia appears to be only part of a general disease affecting the glandular system as a whole; and secondly, that in splenotomy for such a disease there is a disposition to hemorrhage with which surgery is incompetent to deal. It can neither be foreseen by any amount of care, nor coped with by any amount of skill.

"Under such circumstances there is no shirking the conclusion that the operation is physiologically unsound and surgically unsafe, and for leucocythæmia should not be performed."

We doubt not that our readers will readily coincide with this conclusion, and will join us in the hope that no surgeon may hereafter think it necessary to verify Mr. Bryant's results by a repetition of his experiments.

XV. *Cases of Malposition of the Testicle and of Malformation of the Male and Female Urino-genital Organs.* By THOMAS BRYANT.

This paper gives brief notes of twenty-three cases, and is illustrated with two lithographic plates. Several instances are mentioned in which the deformity of hypospadias was transmitted from parent to child. The usual position of the urethral orifice in hypospadias is, as stated, at a point corresponding to the preputial frænum. It may be partially concealed by a fold of the frænum, a fact which should always be borne in mind. We were asked, some years ago, to see a case of supposed impermeable stricture situated immediately within the meatus: the smallest probe could not be made to enter the urethra, and preparations had absolutely been made for urethrotomy. Some unusual appearance about the attachment of the frænum induced us to suggest to the physician in attendance that it might be a case of hypospadias, and such indeed it proved

to be; whether the patient was himself ignorant of his deformity, or whether he was aware of it but preferred to submit to an operation rather than make known a peculiarity of which he may have been ashamed, is uncertain: the incident is mentioned here to show the importance of bearing in mind the possible existence of hypospadias in any case such as that described, as the surgeon may perhaps thereby be saved not a little mortification and annoyance.

XVIII. *Cases of Intestinal Obstruction.* By JOHN BIRKETT.

These cases are two in number, and are both of considerable interest. The first was a case of "intestinal obstruction caused by intussusception of the transverse colon, and complicated with irreducible omental hernia in the scrotum." In this case, which Mr. Birkett did not see until the eighth day of the obstruction, it was thought proper to perform herniotomy in view of the possibility of a portion of gut being involved in the tumour, though Mr. Birkett was disposed to think, what the operation revealed, that the contents of the sac were omental merely, with a little serum. This case may be compared with Mr. Bryant's, in which the obstruction was from a fibrous band, successfully treated by operation. [See No. of this Journal for July, 1867, page 263], and with Dr. Agnew's, reported by Dr. T. H. Andrews to the Philadelphia Pathological Society, at their meeting of March 14th, 1866. [See No. of this Journal for January, 1867, page 149.] The second case is of "intussusception of the ileum occurring whilst the patient was suffering with a simple surgical complaint (erysipelas)." Both of these cases terminated fatally, and the post-mortem appearances in either are carefully described.

XIX. *The Results of the Operations for the Removal of Stone from the Human Bladder, performed in Guy's Hospital during the Last Ten Years.* By JOHN BIRKETT.

This is an extremely valuable paper, and is based upon an examination of 162 cases of vesical calculus that were submitted to operation in Guy's Hospital, from 1857 to 1866, inclusive. All but two were males. The youngest was one year of age; the oldest seventy-seven. The total number of deaths was twenty-five. Several tables are given, showing the rates of mortality at different ages, the rates of mortality at different epochs of life, the causes of death after lithotripsy, the causes of death after lithotomy, and the duration of symptoms and the ages in successful cases of either operation respectively.

Of 103 cases under fifteen years of age, in all of which lithotomy was performed, but four proved fatal. Of 59 cases, sixteen years old and upwards, lithotripsy was performed in twenty-five with five deaths (20 per cent.), and lithotomy in twenty-six with twelve deaths (46.15 per cent.), while in five cases, lithotripsy having failed, lithotomy was subsequently resorted to with the mortality of three (60 per cent.).

It would, however, be unfair, as very justly remarked by Mr. Birkett himself, to infer from these statistics that the mortality after lithotomy is more than twice as great as after lithotripsy, and that hence it should be rejected as an ordinary operation. To further illustrate this point we have taken the trouble to extract from Mr. Crosse's prize essay, published in 1835, when lithotripsy was just coming into notice through the labours of Baron Heurteloup and others, the results of all the cases tabulated in his splendid work, of patients twenty years old and upwards, who submitted to lithotomy.

The figures stand as follows: During ten years at Guy's Hospital, lithotripsy having been performed wherever it was thought at all practicable, the number of cases over twenty years of age submitted to either operation has been fifty [see Table I., page 473]; of these twenty proved fatal, a mortality of 40 per cent. At the Norfolk and Norwich Hospital, lithotomy alone being practised, there were 317 cases over twenty years old submitted to operation; of these but sixty five died, giving the comparatively small mortality of 20.5 per cent. [See Crosse's Treatise, etc., London, 1835, Table III., page 162.]

These comparative statistics, it will be seen, tell a very different tale, and while we are perfectly ready to acknowledge the preferability of lithotripsy to lithotomy in *certain selected cases*, we must decline to take the view not unfrequently advanced of late years, that *cutting* for stone is a thing of the past, and

that the patient whose calculus is not submitted to *crushing*, does not receive justice at the hands of his surgeon.

We would gladly dwell upon many other points brought up by Mr. Birkett's most interesting communication, but our limits compel us to be satisfied with giving his conclusions, which we quote in his own language:—

"1. That after an examination of the gross total of the hospital cases submitted to an operation for the removal of a stone from the bladder, the treatment may be regarded as successful in a general point of view.

"2. That in the early periods of life, before puberty, lithotomy may be performed with almost a certainty of success.

"3. That the operation for the removal of a stone from the bladder of adult patients admitted into hospital is attended with increasing risks to life as age advances.

"4. That the adult patients afflicted with stone do not generally seek the surgical assistance provided in an hospital until after the disease has existed for many years.

"5. That in consequence of that delay many cases are precluded from the advantages derived from the operation of lithotripsy.

"6. That upon adults the operation of lithotripsy was more frequently performed than lithotomy.

"7. That lithotripsy in select cases was a successful operation.

"8. That in the class of patients operated on, lithotripsy was followed by active organic disease of the kidneys, which was the cause of death.

"9. That the risks of both the operations increase in proportion to the length of time the stone has been forming in the bladder.

"10. That the mere fact of the duration of the disease does not preclude a successful result after lithotomy.

"11. That the immediate cause of death after lithotomy is disorganization of the kidneys and the effects thereof.

"12. That lithotomy may be attended with success, in some cases, when lithotripsy, from specific local conditions, is not practicable.

"13. That patients cured by lithotripsy were able to leave the hospital sooner than those upon whom lithotomy was performed."

The only fatal case met with under five years of age was in a child who was markedly affected with what is called the hemorrhagic diathesis; his case is made the subject of a special report by Mr. Durham, who performed the operation, and a notice of it will be found in the latter part of this review.

XXII. *The Human Eye in Health and Disease, as seen with the Ophthalmoscope* (Second Series). By C. BADER.

The previous series was published in the volume of Reports for 1865, and was noticed in the number of this Journal for April, 1866, page 496. Mr. Bader's papers are scarcely *clinical* enough in tone to be entirely appropriate among reports of hospital practice, but they are valuable in themselves, and are particularly admirable on account of the very beautiful coloured plates with which they are illustrated. The present series contains two plates, showing in six figures the ophthalmoscopic appearances of the healthy optic nerve (optic disk) and a small portion of the tunics adjoining it, in the fair, the brown, and the dark eye respectively.

J. A., Jr.

We shall now notice the medical papers contained in this volume.

III. *Affections of the Nervous System dependent on Diseases of the Permanent Teeth*. By S. JAMES A. SALTER, M. B., F. R. S.

The nervous derangements to which caries, exostosis, or other diseases of the permanent teeth give rise, is the subject of this paper, which will be found to be one of great interest. The derangements which are thus caused are divided by Mr. Salter "into those which are reflex, secondary, and remote; and those which are direct, immediate, and from contiguity. In the former category would rank epilepsy, neuralgia, paralysis; in the latter, local pain, facial palsy, some forms of amaurosis, etc." Attention is directed by Mr. Salter to the abundant supply of nerves which the teeth receive, the proximity of the lower molars to the auditory passage, and of the upper molars to the orbital cavity and its con-

tents, and to the spheno-maxillary fossa and fissure; it is, therefore, not surprising, he thinks, that serious functional disorder has been the consequence, in many cases, of diseases of the teeth. The diseases of the teeth capable of producing pain, muscular spasm, muscular paralysis, paralysis of some of the nerves of special sense, and perverted nutrition, are caries, with or without exposure of the pulp, exostosis, hypertrophy of the crista petrosa, nodular development of dentine in the pulp cavity, periostitis, whether plastic or suppurative, impaction of permanent teeth in the maxillary bones, and crowding of the teeth from insufficient room. The direct affections, on the other hand, are caused generally by the entanglement of the portio dura of the seventh pair, or of one of the nerves, which enter the orbit by those inflammatory operations and products which tooth diseases engender.

The paper contains the report of 23 cases; 17 of these Dr. Salter believed to be due to reflex irritation and 6 to direct. In the introduction to this paper Mr. Salter says very pertinently that while much has been written about the diseases incident to the first dentition, there is little or nothing in medical literature in regard to diseases caused by imperfections of the second teeth. These diseases are facial neuralgia, cranial neuralgia, general neuralgia, trismus, wry neck, epilepsy, tetanus, paralysis of the arm, amaurosis, deafness, perverted nutrition, superficial sloughing of the cheek, and ulceration of the neck. An interesting case of amaurosis due to the irritation caused by a carious tooth and cured by its extraction, will be found reported in the number of this Journal for April, 1868, p. 382, and the writer of this notice has known a case of violent neuralgia relieved by the removal of a tooth on the fang of which was found a small exostosis.

VII. *Cases of Elephantiasis Græcorum; with Remarks.* By G. OWEN REES, M. D., F. R. S.

This paper contains the report of two cases of this terrible disease, and is introduced, the author tells us, as the cases are illustrative of the two following points:—

1st. That leprosy in its worst forms may be developed in England.

2d. That anæsthesia may be as marked a symptom in the tuberculated form as in the non-tuberculated.

Dr. Rees thinks that the nomenclature proposed by the Committee of the Royal College of Physicians should be adopted, *i. e.*, tuberculated and non-tuberculated elephantiasis. He is disposed to classify this affection among the blood diseases, for he says: "The manner in which it destroys tissue, the fact that it is characterized by deposit, and that its action is capable of extending over the whole organism would seem to point to this conclusion." He likewise regards the fact that leprosy prevails in districts in which fish and salt provision, sometimes more or less putrid, are eaten as corroborative of this view; as do also Dr. Carter and Messrs. Steinhäuser and Shepherd.

VIII. *On Certain Rare Cutaneous Affections.* By C. HILTON FAGGE, M. D.

Dr. Fagge is well and favourably known in this country by his excellent translation of Hebra's work on *Diseases of the Skin*, and this and Article XI., which is also contributed by him, bear evidence that he is a learned dermatologist. The student of cutaneous medicine at Guy's, possesses a great advantage in the collection of models of skin diseases for which the hospital is noted, for when he sees a rare form of disease he can compare it with analogous or similar forms in the museum.

The diseases which are discussed in this paper are: 1. Circumscribed Gangrene of the Skin. 2. Psoriasis Rupoides. 3. Eczema Squamosum Universale seu Pityriasis Rubra. 4. Acne following Variola. 5. Acne Cornea. 6. Recurrent Acute Eczema.

The patient who suffered from circumscribed gangrene of the skin was under the care of Dr. Habershon, was fifty years of age, had had syphilis, and presented the physical signs of consumption. The first symptom of the disease appears to have been a sense of tightness in the legs, which was followed by the appearance of purpuric spots on the lower extremities, and these patches of purpura became gangrenous at the end of a few days, the mortification appearing to commence at the centre of the patches and to extend afterwards towards

their circumference, so that at last the patches assumed a dry shrunken appearance. In a case similar to the above, reported by Dr. Rooke, under the name of erythema gangrenosum, the question arose in the minds of the attending physicians whether the disease could have been intentionally set up by the patient herself, and this view was adopted by Dr. Tilbury Fox, who said that the appearances described might be induced by reblistering a blistered surface, or by applying to it a strong acid. In Dr. Habershon's case the spontaneous nature of the affection could not be doubted. Dr. Fagge says the remarkable symmetry observed in all recorded cases leads to the belief "that the affection is immediately due to some defect of nervous influence, and, possibly, to some morbid state of the ganglionic system of nerves." No treatment that has been tried in these cases has been successful.

In the second variety of disease, which Dr. Fagge proposes to call psoriasis rupioides, after Dr. McCall Anderson, the scales assume "the shape of large conical crusts marked by concentric rings." The name we think is an unfortunate one, as Dr. Fagge himself admits, for the disease merely presents some resemblance to rupia; it does not at all present any evidence of a union of two diseases such as is seen in eczema impetiginoides, for example. The disease does not appear to require a modification of the usual treatment.

The third variety is a disease which has been described by various writers under different names; perhaps the name of pityriasis rubra is that which is most frequently given to it. We think, however, that this name is not entirely correct, as the disease is accompanied by a slight exudation which differs, in some of its characters, from that observed in the different varieties of eczema, and that the name eczema squamosum is equally objectionable. A better term is that proposed by M. Hardy, "pemphigus foliacé" for this disease resembles pemphigus both in its intractability and in the character of the liquid exuded.

The fourth variety is an acne which occasionally follows an attack of variola. This is apparently not frequently met with, as the only author by whom it is mentioned is Hebra. It is not difficult to understand that smallpox should in some cases occasion great irritation of the sebaceous follicles.

To the fifth variety attention was first called by Cazenave, and it has since been more accurately described by Hardy in the following terms: "This affection presents itself in the form of yellowish, gray, or black eminences, pointed, and giving to the touch the sensation of a rasp or a brush. By pressing at the base of these little tumours, they may be made to project still more, and sometimes they may be squeezed out, when the open orifice of the sebaceous follicle becomes visible, and shows what was their seat, and in what way they were produced."

The disease described as recurrent eczema appears to us to be nothing more than the ordinary eczema rubrum, the outbreak of which is frequently accompanied by general symptoms of some gravity, such as were noted in the case reported by Dr. Fagge. The recurrence seventeen days after the first attack does not seem opposed to this view, nor to justify the establishment of a new class.

X. *Cases and Observations in Medical Jurisprudence.* By ALFRED S. TAYLOR, M. D., F. R. S.

This paper contains the history of three cases of poisoning: 1st. By Carbolic acid; 2d. By Cyanide of Potassium; 3d. By Phosphorus.

In the first case a child 21 months old swallowed about two teaspoonfuls of carbolic acid, which had been placed in a saucer, under a bed, for the purpose of disinfection. She was brought at once to the hospital and was seen within ten minutes of the accident by Mr. Henry Taylor, the house surgeon. At that time the following symptoms were noted: pulse, 120; pupils very much contracted and insensible to light; skin cold and clammy; lips blue and respiration very much impeded; a tarry odour was perceived in the breath; she had vomited a little frothy fluid.

The respiration was so much interfered with that it was deemed advisable to perform tracheotomy, which had the effect of enabling the child to breathe with freedom for a short time, but she sank and died twelve hours after admission into the ward.

The following is the result of a post-mortem examination: About the mouth the skin was brown, dry, and shrunken. The interior of the mouth and the œsophagus were very much whitened from the local effects of the acid, the bronchi contained a brown, red, thick mucus which smelt strongly of tar and obviously contained blood. The mucous membrane was pinkish red, and in one spot was covered with diphtheritic membrane. The trachea presented the same appearances as the bronchi, with the addition, of course, of the wound made by the operation.

The change in the walls of the stomach "consisted in raised red-based patches with red borders; they were generally small, but confluent in places, and mostly limited to the summits of the rugæ. The surface of these patches was as though diphtheritic, *i. e.*, on it was a dryish pellicle." The microscope showed that "the superficial layer of the mucous membrane was destroyed, and in points separated, and the dead part showed all its structures perfect, their outlines being rendered very sharp by what may be called a process of cornification, so that every epithelial cell had a horny looking outline, whether seen from the side of it or from the top." In conclusion he says, "that no inflammatory formation existed was thus proved by microscopic examination."

In the second case, a gentleman took by mistake about three grains of cyanide of potassium in solution. Fortunately he at once discovered his error, and seeing on his table a saturated solution of the proto-sulphate of iron, immediately swallowed an ounce and a half of it; he then went to the nearest druggist's, where he obtained a mustard emetic, which brought up matter light blue or greenish in colour. The gentleman, as a consequence of this prompt treatment of himself, recovered perfectly in a few days, the only symptoms complained of being slight constriction about the throat and fauces and some muscular tremors. Dr. Taylor attributes the escape of this person from the effects of the poison to its rapid neutralization by means of the proto-sulphate of iron, by which it was converted into the inert Prussian blue.

In the third case, a girl, æt. 12, took, or had administered to her, it is uncertain which, a quantity of phosphorus paste (rat poison). During life the same symptoms were present, and after death the autopsy revealed the same lesions as occurred in the two cases reported in the *Med.-Chir. Trans.* for 1867, and of which an abstract was given in the April number of this Journal for this year, p. 492.

XI. *On Keloid, Scleriosis, Morphœa, and some Allied Affections.* By C. HILTON FAGGE, M. D.

This is another valuable paper from the pen of Dr. Fagge, and we regret that our space does not permit us to notice it more in detail. From careful observation of a case of the disease described by Dr. Addison, under the name of keloid, and a careful comparison of this with models taken from Dr. Addison's patients, two of whom he had an opportunity of seeing while at work on this paper, Dr. Fagge is inclined to think that the keloid of Addison is an essentially distinct disease from the keloid of Alibert, and closely allied to sclerema, or scleriosis, as Virchow has preferred to call it. In the two patients of Addison whom Dr. Fagge visited, many of the appearances described by the former were found no longer to exist; although much deformity was present in both cases, in consequence of the contraction of the skin.

Under the term morphœa is described a disease of which Dr. Fagge has been able to collect five cases. The following is the history of one of the cases: The patient was about fifty years of age, and first noticed the disease in consequence of the hairs over the part affected becoming snowy white and subsequently falling out. He then noticed a yellowish white patch on the forehead at the roots of the hair, which was slightly raised above the surrounding skin. This patch, as the disease progressed, became depressed and brownish in colour. In the four cases in which the position of the patch is noted, it is a little singular that it should have been on the left side. Dr. Fagge calls attention to the fact that the disease occupied exactly the tract of distribution of the first branch of the facial nerve. Notwithstanding the fact that this disease presents some points of resemblance to scleriosis, our author looks upon them as entirely distinct, and he also controverts the opinion that scleriosis and morphœa are but leprosy, modified by time and climate.

In regard to the causes of these affections nothing new is told us, and the same remark is true of their therapeutics. The microscope shows that the pathological anatomy of the disease consists in an excessive development of the connective tissue cells.

XII. *A Contribution to the History of Visceral Syphilis.* By W. MOXON, M.D.

Attention has of late been called by Dittrich, and more recently by Wilks, Bristowe, Reade, and others to the fact that the syphilitic diathesis is capable of inducing a peculiar degeneration of some of the internal organs. The possibility of this, although denied by John Hunter and Sir Astley Cooper, appears to have been well known to some of their contemporaries. In a work entitled *Practical Observations on the more Obstinate and Inveterate Venereal Complaint*, published in 1784, Schwediauer refers to a case reported by Brambilla, in which a patient, supposed to be suffering from phthisis, took by mistake mercurial ointment, with the effect of entirely relieving him of his trouble, which was afterwards found to depend upon a venereal taint. He also refers to cases reported by Werlhof. of intermittent (?) fever dependent upon constitutional syphilis, and cured by the employment of mercurials. Twenty-seven cases of visceral syphilis are reported by Dr. Moxon in this paper. The cranium and spine were found to be diseased 8 times; the brain, 3 times; the pharynx, 4 times; the rectum, 2 times; larynx or trachea, 10 times; the lungs, 11 times; the spleen, 10 times; the kidneys, 12 times; the testes, 9 times; the Fallopian tubes, 4 times; the tibiæ, 5 times, and the liver, 22 times. Dr. Moxon believes that he reports in this paper the first case in which the peculiar deposit characteristic of visceral syphilis was found in the kidney, the other cases of disease of the kidney being simply instances of lardaceous degeneration.

The disease of the liver and spleen which is regarded as peculiar to syphilis, consists in the deposition of a cheesy looking material within the substance of these glands. The deposition is believed to be due essentially to an excessive growth of the connective tissue of the part: its subsequent degeneration and contraction produce the appearance of a radiated cicatrix on the surface of these glands. So far as is known, there is no peculiar microscopic appearances attached to these deposits. In one case the report says: "The microscope showed only a few old nuclei and many broken ones, with fat grains and molecular debris; the tissue in which these were imbedded being clouded with these grains, and itself of no discoverable structure; it appeared to be the remnant of obsolete liver tissue."

Dr. Moxon says, in conclusion: "One principal fact which I wish to draw attention to is, that the foregoing twenty-six cases include all the examples of the particular kind of hepatic disease described in them, which in the course of 900 inspections I have met with. In other words, whenever, at any parts of the liver, there have been depressed fibrous cicatricial spots, with or without gumous formation, and with adhesion to the contiguous part of the neighbourhood of the organ, there have also been present other conditions of a kind such as to give satisfactory proof that the person was syphilitic. . . . Two other conditions there are which might be taken for the syphilitic scar; one is a local thickening of the capsule, without depression, and without wasting of the tissue. Another, is the branching atrophy of the tissue around the superficial portal veins, producing ramose white seams, but *not depressed*. . . . Yet a third state may be noted, wherein one or two small, yellowish, generally calcareous nodules are found at or near the convex surface of the liver. These are the only representatives of the described parasitic action of the pentastoma denticulatum which I have met with, and I have never seen the parasite in them." This paper is accompanied by two plates.

XIII. *Note on a Case of Melanuria.* By THOMAS STEVENSON, M. D.

The urine, in the case reported by Dr. Stevenson, was passed just before her death, by a woman whose thigh had been amputated in consequence of an osteosarcomatous tumour. She was said to have had an attack of scarlatina a few days after the operation, but this was doubted by some of her attendants. Previous to the passing of the black urine the stump had been dressed with a strong solution of carbolic acid; and Dr. Stevenson says that it is somewhat

remarkable that in all cases in which true black urine has been passed, either wood or coal tar creasote—both of which contain carbolic acid—have been administered either internally or externally. The urine was first tested for blood, but none was found; it was then determined to seek for indigo, but although a careful analysis of the urine was made, no evidence of its presence could be detected. Potassa appeared to dissolve the pigment with the production of a rich, brown colour; but when this solution was treated with grape sugar no indigo blue was deposited. Dr. Stevenson, as the result of a careful investigation, declares his inability to state positively to what the urine owed its colour. It will be recollected in the case of poisoning by carbolic acid, reported by Dr. Taylor in this volume, a black colour of the urine was not mentioned as one of the symptoms.

XVI. *On the Guaiacum Process for the Detection of Blood in Medico-Legal Cases. The Antozone Test.* By ALFRED S. TAYLOR, M. D., F. R. S.

This test is not altogether new: it was originally suggested by Van Deen, a Dutch chemist, who employed an alcoholic solution of guaiac and what he supposed was ozonized oil of turpentine. Very little attention was paid to it until 1863, when the subject underwent a minute critical examination by Dr. Liman, of Berlin, by whom it was not considered satisfactory; for he says, that while a failure to respond to this test, indicates that there is no blood present, the converse is not true, as he has obtained the characteristic reaction with other liquids. Dr. Taylor, as a consequence of some experiments performed by himself, at first adopted the opinions of Dr. Liman; but having discovered that oil of turpentine is not a good liquid to experiment with, he has recently tried, as suggested by Drs. Day and Schönbein, the peroxide of hydrogen and ozonized ether. It will be noted that ozonized ether contains not ozone but antozone. Two liquids are used, therefore, for the detection of the red colouring matter of the blood: 1. An alcoholic solution of guaiacum resin; 2. A liquid containing not ozone, as Van Deen supposed, but antozone, or peroxide of hydrogen.

There are certain organic and inorganic substances which have the effect of changing to a blue colour the resin precipitated by water from its alcohol solution; and among these may be mentioned all those hyperoxides which contain oxygen in the form of ozone, as manganate and permanganate of potassa, peroxide of lead, and manganese: also bodies which operate through the agency of water as oxidizers, such as chlorine, bromine, iodine, hyponitric acid, and the hypochlorates. Among organic bodies gum, gluten, unboiled milk, exercise this power to a slight extent; while on the other hand boiled milk, starch, fibrin, and the colouring matter of the blood have no effect upon the precipitate, and the same is true of all mineral compounds which contain oxygen in the form of antozone. But while the colouring matter of the blood alone is without action upon the precipitated guaiac, it acquires the property of changing the colour in the presence of antozone; and it is the only substance which not having this property under ordinary circumstances acquires it when antozone is added to it. To discover whether the liquid containing antozone is in a proper condition for use, add to it a few drops of a solution of bichromate of potassa when a blue colour should be immediately produced, in consequence of the formation of perchromic acid.

To test for blood, the following method is to be pursued. Add a few drops of the tincture of the resin to four drachms of water; then add a few drops of the colouring matter of the blood, enough to give a faint red tint; to this a few drops of peroxide of hydrogen or ozonized ether is added; then a blue colour should begin at once to show itself. The liquid containing the antozone should not be added before the suspected liquid, as was done by Dr. Liman, for it would then be impossible to say whether the liquid had itself changed the resin to a blue colour, or whether it had merely done so in consequence of the presence of antozone.

For the detection of blood upon the clothing, Dr. Taylor recommends the following process: The part is first to be wetted with a little water, a little tincture of guaiac is then to be dropped upon it, and then a piece of white blotting paper should be pressed upon the spot; if no blue colour is developed, there is nothing in the material or dye to affect the reaction. Another drop of

tincture of guaiac, and then a few drops of peroxide of hydrogen should be added, and then, upon pressing white blotting paper on the spot, a blue colour will at once show itself on the paper. Dr. Taylor succeeded in obtaining the characteristic reaction in the case of drops of blood which had been on a towel for ten years. This test does not enable us to say, of course, to what kind of animal the blood belongs. Even the red liquid of the common house fly, Dr. Taylor says, will produce the effect above mentioned. Its advantage is, that a small quantity, beyond the application of the ordinary chemical tests, may be detected in this way. In fact, there is no other method which approaches it in delicacy, except that of Mr. Sorby, of Sheffield.

So small a quantity as one drop of blood in eight ounces of water may be detected by operating on one or two drachms. Nor does the admixture of mucus, urine, or other liquid without oxidizing effect upon the blood, render this test inapplicable. Dr. Taylor believes that the colouring matter of the blood acts by converting the antozone into ozone or nascent oxygen, and in this way effects the oxidation of the resin—a property which none of the organic colouring principles resembling blood, possess.

XVII. Dissections of Acephalous Monsters without Head, Heart, Lungs, or Liver. By J. BRAXTON HICKS, M. D., F. R. S., and JAMES BANKART.

Four specimens of this kind of monstrosity have fallen into the hands of these gentlemen, and in the present paper an account of the dissection of two of them is given. The manner in which the circulation is carried on in these cases has, of course, been a subject of much investigation. The contraction of the blood-vessels alone would not account for the propulsion of the blood in a given direction, without the presence of valves. On this subject, Dr. Hicks says: "For, if the fœtus have no propelling organ in itself, it is evident either that it must receive an impulse through its vessels anastomosing in the placenta with those of the other fœtal heart (in the case of a twin conception), or that a circulation akin to the vegetable must obtain in the case of a single fœtus, or in a twin case, where no anastomosis exists."

But one artery and one vein were found in each case. In one case, the artery, after descending to the brim of the pelvis, where it gave off branches for the lower extremities, ascended towards the rudimentary thorax, sending off in its course branches to the intestines and kidneys, and finally divided into three branches, one for each upper extremity, the third for the rest of the upper part of the body. The vein divided into two branches, one of which was distributed to the upper, the other to the lower part of the body. In the other case, the artery descended till it reached the inguinal region, where it sent off a small branch to supply the left leg; it then passed backwards and upwards to the lumbar vertebræ, where it gave off a branch to the right leg. Ascending, it supplied arteries to the kidney, supra-renal capsules, mesentery, and other parts, and finally divided into three branches, which went to supply the upper extremities. The vein had three principal branches; one of these received its branches from the lower extremities, kidneys, mesentery, &c., and then, just as it entered the thorax, joined a second branch which came straight from the umbilicus; at the level of the upper extremities it divided into three branches, which were distributed to the upper part of the body. The other branch was distributed to the left side of the body. No trace of valves could be detected either in the arteries or veins. In each case, at the upper part of the abdominal cavity near the median line, was a round glandular-looking body about three-quarters of an inch in diameter. Its structure appeared to be similar to that of the spleen. No excretory duct could be found, but it was supplied with an artery and vein; it is therefore probable that it represented the spleen. Three plates accompany this paper.

XX. A Case of the Hemorrhagic Diathesis, with Remarks. By ARTHUR E. DURHAM.

In this case, the patient, a boy of three and a half years of age, had presented symptoms of stone in the bladder for four or five months. His mother, when told of the nature of the operation intended for his relief, expressed her conviction that it would prove fatal. "For," she said, "three of his brothers have bled to death from very little wounds—it is in the family." Notwithstanding the unfavourable nature of the case, Mr. Durham, with the consent of his colleagues,

determined to operate, as it was evident that the child would not live long unless the stone were removed. The operation was successfully performed, less than the usual quantity of blood being lost at the time; between three and four hours afterwards, a slight oozing from the external incision was noticed, and in about two hours more the child was dead. After death, a clot of firm consistency was found in the bladder, distending it to some extent. The mother, upon being questioned, said: "As far back as my own grandmother's generation, and from hers downwards, the male children have been subject to great bleeding from slight causes. Three of my own brothers died before they were four years old, from loss of blood. Of my own offspring, three have already died from the same cause. This one makes the fourth." She also stated that the male children of her sister exhibited evidences of possessing a similar diathesis, but that none had, up to that time, died. Of her own children who had died of hemorrhage, one, aged thirteen months, died in consequence of the lancing of an abscess. Another, aged seven years, died from loss of blood, caused by biting his tongue, and the third cut his gums, and bled to death.

Mr. Durham says there are two conditions generally confounded under the name of hemorrhagic diathesis. In one condition there is a tendency to profuse hemorrhage from small wounds, in the other there is a great inability to bear the loss of small quantities of blood.

XXI. *On Gastric Erosion.* By F. W. PAVY, M. D., F. R. S.

It is well known that Hunter looked upon the erosion of the stomach, which is frequently found after death, as the effect of post-mortem softening, and explained the immunity of the mucous membrane of this organ from digestion by its own secretion during life by the protecting influence of the living principle. Bernard, however, proved that this explanation was insufficient, for he showed that the hind legs of a living frog underwent digestion when introduced into the stomach of a dog through a fistulous opening, and Dr. Pavy has found that the tip of a rabbit's ear was similarly attacked. Bernard then suggested that the stomach escaped digestion in consequence of the power it possesses of renewing constantly its epithelial layer, and that the cessation of this process permits the unrestrained action of the gastric juice upon its coats. Dr. Pavy, wishing to submit this explanation to the test of experiment, excised patches of mucous membrane from the stomachs of dogs, and was surprised to find that no further destruction of the walls occurred, and that ultimately in most of the cases repair by cicatrization took place.

In a communication on the "Immunity enjoyed by the Stomach from being digested by its own secretion during life," in the *Transactions of the Royal Society* for 1863, Dr. Pavy has given the results of a number of experiments, by which he was conducted to the conclusion that the cause of this immunity is to be found in the excessive alkalinity of the blood in the gastric veins.

The alkalinity of the blood, it will readily be conceded, is greatest just when the acidity of the secretion is most marked. Now, if by any means we can reduce the degree of alkalinity of the blood circulating through the stomach, or on the other hand increase the acidity of the secretion, we shall bring about digestion of its coats. The former may be accomplished by preventing the flow of blood through the organs, either by ligaturing its vessels, or by causing a constricted portion of its walls to protrude into its cavity; the latter may be induced by introducing some non-corrosive acid, as citric, into the stomach.

The reason for the escape from digestion of the larvæ of the æstrus (popularly called bots), which are frequently found in the stomach of a horse, is simply that they are so firmly attached to the walls of the stomach as almost to partake of their nature, besides which chitine, which forms the basis of their external tissue, is of an exceedingly indigestible nature. Leeches or earthworms undergo digestion like ordinary morsels of food. In a treatise on Embolism, published in 1860, Cohn advances the view that ulcers of the stomach are due to embolism of some of its arteries, which by cutting off the supply of blood from a certain portion of it allows digestion of its walls to take place.

All of these papers are of more than usual interest, and we regret that our limits will not permit us to notice some of them much more in detail. We look upon the volume as one of the most valuable that has ever been issued by the Staff of Guy's Hospital.

J. H. H.

ART. XVIII.—*Transactions of the Obstetrical Society of London, for the year 1867.* Vol. IX. With a list of Officers, Fellows, etc. 8vo. pp. 307. London, 1868.

THE volume before us opens with the account of a case of *Fracture of the Pelvis, with Injury to the Uterus in the Sixth Month of Pregnancy*; death occurring at a subsequent delivery, by Dr. T. FAIRBANK, of London. A sketch of this case has been given in the number of this Journal for April, 1867, p. 553. And also of the second paper, on *Criminal Abortion*, by Dr. JOHN SHORTT, of India, in the same number, p. 554.

The third paper is the account of a case of *Paraplegia during Pregnancy*, by Dr. P. BOULTON. But few parallel cases are on record. The patient was tall, stout, arthritic looking; thirty-eight years old; the mother of a living healthy child. When she supposed she was some months advanced in her second pregnancy (May 17, 1866), she was apparently in perfect health. Some two weeks subsequently she was paraplegic—being quite unable to stand or to grasp anything tightly, though when told to move her extremities she could do so pretty well. There was complete insensibility of the limbs—power of speech perfect—questions being answered rationally. Memory entirely gone. Tongue not directed to either side when protruded. Features natural. Bowels very torpid; urine loaded with phosphates, but not albuminous. No pain of head. The patient slept badly. The above symptoms had come on gradually during the preceding fortnight. There was, in addition, loss of appetite, rapid emaciation, some contraction of the knees, with great pain upon any attempt being made forcibly to extend them. The heart was large and fatty. The absence of all signs of irritation—convulsions, cramp, formication, œdema, etc., and the asthenic appearance of the patient, led Dr. B. to consider the case as one of white softening with consequent diminution of the amount of blood in the brain and cord. Quinia was given in two grain doses, and the bowels were kept regular by aperients. At the end of two weeks, no improvement having occurred, strychnia was given in the dose of one-sixteenth of a grain. The case still continuing without improvement, a consultation was had with Dr. Eastlake, who accorded with Dr. B.'s view of the case. The action of the foetal heart was heard distinctly. The patient was directed tincture of nux vomica in conjunction with the compound tincture of aloes. This treatment was continued for some time, but with little benefit. Occasional pains were experienced over the region of the kidneys with an increase of phosphates in the urine, which remained still non-albuminous.

July 11. Dr. SREVEKING was added to the consultation. He recognized the case as one of extensive softening of the brain and spinal cord. He did not consider the patient to be pregnant, believing that the action of the maternal arteries had been mistaken for that of the foetal heart. He advised a sedative at bedtime, quinia during the day, and a liniment to the knee.

13th. The patient was delivered of an eight months' female child, breech presentation, which had been dead, apparently, for a day or two. She had a good recovery, but with no improvement of memory.

27th. Complained of intense pain over the sacrum, for which she was blistered. On the 29th the pain was relieved, could better extend her legs, slept better, had eaten more, was more cheerful; still unable to stand; no improvement of memory. Up to January, 1867, she remained nearly stationary. She now eats well, has regained flesh, her bowels are moved regularly; urine clear, *sp. gr.* 1022, contains no albumen; but "in spite of strychnia, quinine, iron, ammonia, iodide of potassium, blisters, and fresh air, taken on fine days, in a Bath chair; her memory and her ability to stand alone are gone.

Article 4.—*Fœtal Peritonitis* (in Utero), by W. A. HUNT, Esq., King's College, London, as shown by post-mortem appearances in a male fœtus (*twin*) which lived one hour after birth.

"The abdominal viscera presented the indications of both chronic and recent peritonitis. On raising the intensely congested omentum, the equally congested

intestines were painted over with recent lymph, and in parts constricted by tolerably firm threads, the result probably of some former attack. The abdomen resembled that of some animal which had been injected with an irritating fluid a few hours before death, and also that of one which had survived an attack a considerable time previous to death—a curious circumstance in the fetus.”

Article 5.—*Description of a Curious Monster*, which lived some time after birth, by Dr. W. ROSS. The peculiar deformity in this case resulted from a great deficiency of osseous material, causing considerable arrest of development of the temporal, parietal, and superior maxillary bones. The parents were half caste Africans, and perfectly healthy. Of the exact character and extent of the monstrosity no adequate idea could be furnished by any verbal description unaided by the coloured drawing which accompanies the paper.

Article 6.—An account, by Dr. J. HALL DAVIS, of London, of a *Polypiform Cyst*, growing from the anterior wall of the vagina—in a single woman, twenty-eight years of age. The cyst was distended by a viscid olive coloured fluid and projected at the os externum vaginae. Treated by incisions and iodine injections. The growth at the end of a week being but little diminished, Dr. D. decided to remove it by the wire rope écraseur, under chloroform. The upper fourth of the growth was purposely left to avoid injury to the vesico-vaginal septum. The patient had subsequently an opiate, passed a good night, did well, and was discharged convalescent some days after the removal of the growth.

A very interesting paper on *Diphtheria*, by Dr. A. WYNN WILLIAMS, is the seventh article. Dr. W. contends that diphtheria, in its “earliest commencement,” has a local origin, the blood being affected secondarily. He considers that the depression of the system coincides with the appearance of the false membrane, and as this increases in extent so does the depression; which latter is caused by the absorption of fresh poisonous matter into the system, as in pyemia, from the decomposed and highly offensive pseudo-membrane, and that on the disappearance or removal of the latter, the depression is at once ameliorated. Dr. W. has found no remedy so efficacious in diphtheria, and at the same time so little likely to prove mischievous in the hands of parents, as the free local application of a strong solution of tannic acid—two drachms of the acid to two of proof spirit, and six of distilled water. When the deposit is situated either in the pharynx, œsophagus, larynx or trachea, the solution should be injected into these parts by means of what is known now as “the fluid pulverizer.” Internally Dr. W. administers a mixture containing chlorate of potash, acidulated with hydrochloric acid, and bark or some other vegetable bitter, followed by the tincture of sesquichloride of iron, and, should paralysis continue, with the addition of tincture of nux vomica, or strychnia. Dr. W. thinks, also, that frequently washing the mouth with a solution of permanganate of potash would be of service in severe cases.

The 8th article is an account, by Dr. HENRY C. ROSE, of a case of *Disease of both Ovaries*—the right ovary forming a communication with the cæcum, and thence externally; the left ovary emptying itself into the rectum. The case terminated fatally at the end of about ten months after the disease of the ovaries was detected. The subject of this case was forty-two years of age, of sallow complexion, and somewhat anæmic; had suffered, she said, from menorrhagia for about two years; had had primary syphilis a few years previous to coming under treatment; had borne two children, of whom the youngest was sixteen years old. The patient had suffered, for a period of some nine months, from a good deal of pain in her left side.

Article 9.—An account, by Dr. E. PARSON, of London, of a case where *Local Anæsthesia*, by the *Ether Spray*, was employed in the removal of epithelioma of the cervix uteri by the écraseur. This case, to use the words of the relator, is interesting from several facts: 1. The peculiar susceptibility to the depressing effect of chloroform on the heart; possibly in some degree to be accounted for by the greatly diminished power of the heart from the frequent and excessive hemorrhage which this patient had previously been suffering. 2. The pain of the crushing action of the écraseur on the cervix uteri, paralyzing the heart of the patient just as efficiently as the chloroform. 3. The

application of the ether spray in deadening the sensibility of the diseased cervix uteri to such an extent as to allow the whole of the vaginal portion of the cervix to be removed with comparatively little pain or inconvenience. 4. This case teaches another lesson, that in all probability the sensation of burning was owing to the intense cold conveyed by the metal Bozeman's speculum and the metal retractors, upon all of which the ether spray could scarcely be prevented from playing; and possibly, in future experience, it may be advisable to employ a wooden duck-billed speculum and wooden retractors. And lastly it is a practical fact in removing part of the cervix, that in this case at least the application of the écraseur was greatly facilitated by gently drawing the cervix uteri slightly towards the outlet of the pelvis, in the axis of the parturient tract, instead of its being drawn directly downwards. This allowed the operator to fix the chain of the écraseur with the greatest possible precision, so as to take off the whole of the vaginal portion of the cervix without wounding the bladder.

Article 10.—Three cases of *A Third Nipple in the Human Subject*, reported by Dr. W. BATHURST WOODMAN. The first two cases occurred in a mother and her daughter; the third in a male. In all these cases the supernumerary nipple occurred on the left breast.

Article 11.—The same gentleman relates a case of *Chronic Inversion of the Uterus*, which had existed for more than five years, without giving rise to any serious symptom.

Article 12.—*A Rare Case of Intermural Fœtation*, related by Dr. J. BRAXTON HICKS. The patient, æt. 35, was delivered of her first child in August, 1864. Rather more than a year before her death she aborted at the fourth month. Not a drop of blood was lost on that occasion. The body of the fœtus was first expelled, and next day the head. No trace of placenta found. She recovered very well without any blood being lost. About five and a half months before her death she again conceived; its exact date was concealed by frequent metrorrhagia. Continued to enlarge till December 8, 1866, when, after some pains, a fœtus, about the usual size of one at five and a half months, was expelled without hemorrhage. The secundines not having come away, the fingers were introduced within the uterus for their removal; but they only encountered a ragged opening, with something soft within it. The case was left under the usual treatment. For four days things went on very well, when violent bearing-down pains occurred, in the midst of which the patient complained of severe pain in the abdomen; she became pale and faint, with gaspings, and died in a state of collapse within two hours. Necropsy next day. Body very anæmic. Within the peritoneum clotted blood was found everywhere diffused between the viscera, without much displacement. The quantity of clot was equivalent to about two pints of blood. The serum had gravitated into the pelvis; pressure downwards caused it to well up freely. On removing the clots the fundus of the uterus on its right side was found enlarged, reaching above the brim. Over this enlargement, beneath the peritoneum, veins of great size ran. At its upper part a rupture, about three-quarters of an inch long, had taken place, through which blood had escaped; and within it could be seen placental villi. The entire uterus being carefully removed, no adhesions were anywhere detected; its body was found enlarged symmetrically, except its upper part, towards the right side, the seat of the enlargement. The latter extended two inches beyond the limits of the enlarged uterus, being about two and a half inches in diameter at its base, where it arose from the uterine walls. Some of the large bloodvessels coursing over it were the third of an inch in diameter. A section being made through the enlargement, vertically, its walls generally were found to be about three-fourths of an inch thick; the cavity about five inches long. At the upper part, rather to the right side, was an opening about two inches in diameter, with ragged, loose, and free, sloughy-looking edges. Inside this opening could be seen the placenta, which filled the whole enlargement; it was slightly decomposed for about half an inch into its substance, the remainder pale and natural. The walls of the uterus were most attenuated at the spot where the laceration took place. Large sinuses were observed as in ordinary pregnancy. The uterus was not lined with anything

like decidua. Its mucous membrane was pale towards the os uteri, but became gradually more red towards the opening referred to. The entire length of the uterus externally, eight inches; diameter, six inches. There was no communication between the two lacerations; sound placenta, of two inches thickness, intervened. In this case it would appear that an intermural foetation had taken place; that the foetus continued to enlarge, distending the intermural cyst towards the peritoneal and uterine cavities, at about the same rate, though probably rather more readily towards the latter, into which doubtless it bulged, so as to distend the uterus to the size already mentioned. This portion giving way, permitted the escape of the foetus, simulating thus an ordinary abortion. The uterus now shrank, and the tissue retracted, leaving the free lacerated edges as the only evidence, four days after, of that portion which bulged into its cavity. The mass of placenta being a source of irritation to the uterus, contractions ensued, causing compression of the cavity in which the placenta was contained, and producing great pressure upon the peritoneal side of the cavity, the latter finally gave way, rupturing a large subperitoneal vein, and hence the fatal hemorrhage.

Article 13.—*A fatal Case of Rupture of the Uterus*, occurring at the eighth month of pregnancy. By ROBERT DUNN, F. R. C. S., etc. Although this case presents a few points of interest, it conveys, comparatively, but little practical instruction.

Article 14.—*On the Treatment of Labour, complicated by Ovarian Tumour*. In this very excellent paper Dr. W. S. PLAYFAIR has collected and carefully analyzed the details of 57 cases, in which an ovarian tumour was pushed down in front of the presenting part, causing thus an obstruction to the passage of the child. He has limited the cases to those in which the tumour was ovarian, and, with one or two exceptions, separately noted, has not included any in which there was reasonable doubt as to the nature of the case. Out of the 57 cases collected by Dr. P., in 13 the labour was terminated by the natural powers alone. Of these, seven of the mothers recovered, and six—*i. e.*, 46.1 per cent., died. In order that a case of this sort may terminate without assistance, it is evident that the tumour must be very small or very compressible. Even in the latter case, before the child could be expelled, the tumour must have been subjected to an extreme degree of pressure, so that its bulk might be sufficiently diminished to permit the presenting part to pass. This, without doubt, would be extremely apt to cause in it an inflammatory action, which may, perhaps, account for the unfavourable results that have followed cases left to nature alone. In favourable contrast to the foregoing are the cases in which the size of the tumour has been diminished by puncture. These were nine in number; in all the mothers recovered. Six of the nine children were also saved. Unfortunately, in a large proportion of cases, the tumour is semi-solid; puncture even here should be invariably attempted, even when no fluctuation is apparent. The favourable results following puncture would seem, says Dr. P., to point to a resort to it, even when the tumour is of so small a size as not to preclude the possibility of delivery by the natural powers, in order to diminish as much as possible the pressure and contusion to which it is certain to be subjected.

"In five of the cases it was found possible to return the tumour above the pelvic brim, and in these also the termination was very favourable, all the mothers recovering. Failing puncture, therefore, this alternative should always be tried, and it will sometimes be found possible to dispose of the tumour in this way, even when it seems to be firmly wedged down in front of the presenting part, and is apparently hopelessly fixed in its unfavourable position."

In fifteen cases craniotomy was resorted to four times after puncture of the tumour. In two of the cases the tumour was not sufficiently diminished in size by the puncture to admit of the passage of the child, but in the other two it is expressly stated that the tumour collapsed, and that perforation was only performed because the child was known to be dead; hence, these two cases might fairly be left out of consideration in estimating the mortality of this treatment. Of these fifteen cases, eight of the mothers recovered and seven, or nearly one-half, died. Even in the cases that recovered, it is expressly noted in several instances that the recovery was only imperfect, and that the ovarian tumour

rapidly increased in size, and before long carried off the patient. This great mortality after craniotomy is attributed by Dr. P. to the same causes which give rise to the like unfavourable results in cases left to nature alone, the excessive contusion to which the tumour is necessarily subjected.

In respect to the other terminations of the complication in question, in four cases the tumour ruptured spontaneously, two of the mothers recovering. Twice the uterus ruptured before any attempt at delivery had been made. Turning was resorted to five times, four of the mothers dying, another proof of the great danger of extreme contusion of the tumour. The forceps were applied twice. Lastly, in one case, a sort of natural ovariectomy was performed, the tumour protruding through a laceration in the vagina, was removed by ligature. This patient had a good recovery.

With regard to the children, the mortality was least when the tumour was punctured or pushed above the pelvic brim, and greatest when the delivery was left to the natural powers; a result we might expect when we consider the prolonged labour necessary to effect delivery in the latter class of cases.

In the discussion to which the paper of Dr. P. gave rise, Dr. Barnes said that one subject of importance had not been sufficiently considered, the propriety, namely, of inducing labour when pregnancy was complicated with ovarian tumour.

"It might be laid down," Dr. B. remarked, "as a general law, that nature would not tolerate the concurrent progress of these two conditions, the simultaneous growth of two tumours like the pregnant uterus and an ovarian tumour. Something must give way. Dr. B. had observed three orders of events, which all pointed to the truth of this law, and to the practice he recommended. 1st. He had seen the tumour burst and the patient die; and in another case he had seen the tumour rotated on its axis so that the pedicle was strangulated, leading to rupture of vessels, labour occurring prematurely under the agony of death: or the uterus may rupture. 2d. He had repeatedly seen premature labor occur spontaneously with good result. 3d. The distress in breathing and hectic induced may be so urgent as to compel the physician to interfere. He had frequently acted in obedience to this law, and with the best results. The indication seemed to be clear, in all serious complications to pregnancy, to reduce the case to its simplest expression by eliminating one of the elements of complication. The most fitting element to remove was the pregnancy. This done, the ovarian tumour could be dealt with at a convenient time according to its special circumstances."

Article 15th.—*On a New Expanding Speculum for Operations on the Cervix Uteri*, by ROBERT ELLIS. The instrument in question is certainly a very ingenious one. Without introducing the wood-cuts, it would be difficult to form an accurate idea of its construction and mode of action. A similar remark will apply equally to the subject of Article 16th, in which the same gentleman describes a *Self-Retaining Tenaculum for Operations on the Cervix Uteri*.

Article 17.—*The Account of a Case in which the "greater portion of a Dead Fœtus was retained in utero for a period of four years,"* by Dr. A. HALLEY. This case is replete with interest. It will scarcely admit of an analysis.

Article 18.—A case of *Extra-Uterine Fœtation*, treated by abdominal section, with recovery. This case is related by Dr. J. BRAXTON HICKS. It is a highly instructive one, furnishing, as it does, conclusive evidence of the practicability and safety of the abdominal section for the relief of patients suffering from the inconvenience and danger incident to extra-uterine fœtation. The patient was twenty-six years of age. The operation was not attended with any particular difficulty, and the patient's recovery, under a proper diet, and a regimen carefully conducted, with suitable dressings to place of operation, was remarkably prompt and complete.

Mr. Harper, in commenting on the case, remarked that, speaking generally, he thought, as regards operative treatment, the cases arrange themselves into two classes. One class includes those cases in which there were more or less severe attacks of peritonitis, producing adhesions to the abdominal walls and other surrounding parts, and in which, should the woman survive, there is an effort made to get rid of the fœtus by suppuration. The other class includes those cases

where the fœtus escapes suddenly, producing fatal hemorrhage or fatal peritonitis. The case related by Dr. Hicks belonged to the first class, and Mr. H. considered that there could be no doubt that opening the sac formed by peritoneal adhesions was a safe and philosophical plan of treatment, and one always to be adopted when feasible; but he would go further, and inquire whether we should not extend this line of practice to the second class of cases, and open the abdomen freely in those instances in which there was no doubt that the fœtus was not contained in the uterus, and where the woman is liable to speedy death at any moment, and not to wait for peritonitis to produce adhesions.

Article 19.—Cases and remarks illustrating the *History of Pregnancy complicated with Smallpox*, by Dr. ROBERT BARNES. The first question which arises is as to the influence of intercurrent smallpox upon pregnancy. Does it interrupt the course of gestation? In the three cases related by Dr. B., labour came on prematurely. The next question which presents itself is: In what way does smallpox excite premature labour? For the very excellent exposition of this question presented by Dr. B., we must refer our readers to the paper itself. To what extent is the life of the mother endangered? In the three cases related the mothers recovered, in another case seen by Dr. B., the notes of which he had mislaid, the termination was fatal. Dr. B. considers it in the highest degree probable that the fatality is much the greatest from attacks of unmodified smallpox. It is to be remarked, however, that pregnant women not unfrequently pass through genuine variola in safety. Still variola, pure or modified, must be looked upon as a dangerous complication, but less so, Dr. B. is inclined to believe, than typhus or typhoid fever. It does not appear that there was any excessive loss of blood during labour in the cases referred to. The chief danger arises, probably, in the puerperal state. In respect to influence upon the child: If the pregnancy is not interrupted, and the child is born alive at term, it will probably have gone through the disease. A practical question presents itself, Can we, by inducing labour in a pregnant woman, attacked with smallpox, increase the chances of safety of the child? In deciding this question it is necessary to consider that it is highly probable, in the first place, labour may occur spontaneously in the course of the disease; if not, the child may perish with the mother, or it may perish independently in utero; or it may take the disease and survive, or again, it may not take the disease in utero, but be born while susceptible to the infection, whilst the mother is still suffering from variola. In such a case is immediate vaccination desirable? If this be answered in the affirmative, as Dr. B. believes it ought to be, then, is it desirable in cases where labour has not occurred spontaneously, to induce it, in order to secure the opportunity of vaccinating the infant before it has become infected? No absolute rule can, Dr. B. thinks, be laid down. The condition of the mother, the mildness of the disease, will, in some cases, indicate the propriety of not interfering. But, as a general rule, Dr. B. is disposed to conclude that labour should be provoked at an early stage by introducing a flexible bougie into the uterus.

Article 20.—Case of *Variola in the Fifth Month of Pregnancy*, with consequent delivery at the full term of a dead child. By C. W. MILNE.

Article 21.—Dr. MEADOWS exhibited a specimen of *Monstrosity*, with a report on its peculiarities by that gentleman and Dr. A. J. BANNISTER. The child was born at term and survived for only a few minutes. It was perfectly formed as regards the upper portion of its body, but in place of lower extremities there was a sort of caudal appendage, which moved backwards and forwards as if by a hinge-joint. There was no anal orifice nor any external genital apparatus.

Article 22.—An account of *Hereditary Convulsions* confined to the males of a family, occurring in infancy, and at about the eighth month of intro-uterine life, by J. B. CURGENVEN. Mrs. N. was the mother of nine children, born alive at the full period—five girls and four boys. Two of the girls were twins; they died within five days after birth of marasmus; two other girls died during childhood, one of scarlet fever, the other of measles. One girl is living and healthy. Neither of the five had convulsions. Of the four boys, two died of convulsions in infancy, the others are living and healthy but during infancy and teething they suffered convulsions. In the last four pregnancies the fœtus died about

the eighth month, and, judging from the sensations of the mother immediately preceding the death, it is evident they all died of convulsions. They were all males. During the three previous pregnancies the foetus died suddenly in a somewhat similar manner at about the eighth month. The mother of Mrs. N. had eleven children, of whom three boys and four girls died of convulsions at from three to fourteen months; two boys lived, but suffered from frequent attacks of convulsions. Two girls lived to grow up without convulsions, one being Mrs. N. The parents of both families were strong and healthy.

Article 23.—*The Salivation of Pregnancy successfully treated*, with a case, by Dr. T. SKINNER, Liverpool. The remedy employed by Dr. S. for the cure of this terrible annoyance is as follows: R.—Aluminis sulphatis, ℥iss; magnesiæ sulphatis, ℥iij; acidi sulphurici diluti, ℥iij; tinct. opii ℥ss; misturæ formylī concent., ad ℥vj.—M. Dose, a dessert-spoonful thrice daily, after food, in a wine-glassful of water.

The last ingredient in the mixture is composed of one fluidrachm of chloroform, briskly agitated with a pint of spring water until the globules of the chloroform entirely disappear.

Article 24.—*On Carbolized Sponge Tents*, by R. ELLIS, Esq. An abstract of this paper has already appeared in the number of this Journal for January, 1868, p. 276.

Article 25.—*On Puerperal Temperatures*, by W. SQUIRE. This highly interesting paper is deserving a very attentive study. The general conclusions deducible, as the author believes from his observations, are—

“1st. That no great elevation of temperature arises in natural labour. 2d. That there is afterwards a considerable fall of temperature which is favoured by sleep. 3d. That there is a subsequent exaltation of temperature which has for its natural termination the secretion of milk. 4th. That the bringing the method of observation followed by Mr. S. to the study of the puerperal state would add an element of certainty to the principles and details of its management, and afford an additional guide for safe conduct through some of its complications.”

Article 26.—*Description of a Drill Crotchet*, with indications for its employment, by Dr. EASTLAKE. The instrument consists of a hollow metallic cylinder eleven inches long; to one extremity of which is attached a transverse wooden handle, and to the other a solid steel trocar point. Through an aperture in the centre of the handle, communicating with the hollow of the tube, is inserted a steel rod, having a rack at its extreme end, which acting against a cog wheel close to the apex of the instrument forces out, at any desired angle, a bifid crotchet. In applying the instrument, the handle being held firmly in the right hand, the trocar point, guarded by the groove, between the first two fingers of the left hand, is carried up to the foetal head, and fixed at right angles with the skull, when the latter is to be perforated by a semi-rotary movement of the instrument. So soon as the foetal cranium is perforated, the crotchet is to be made to protrude. A firm hold by the latter being obtained, the fingers of the left hand should be placed outside that portion of the skull to which the crotchet is attached internally. In this way, if both hands be made to act in unison during traction, all danger to the soft parts of the mother will be avoided.

The special circumstances which may be said to render the employment of the *drill crotchet* practicable and especially useful are, according to Dr. E., the following: 1. The presentation being natural, the foetus being dead, and the head within reach. 2. The patient still in the first stage of labour, and the os uteri being sufficiently dilated to admit of the introduction of at least two fingers. 3. If the delivery is to be effected by the sole use of the drill crotchet, there must be an absence of any great disproportion between the foetal skull and the canal of the maternal pelvis, except in the case of a hydrocephalic head, when the use of the instrument would probably alone be sufficient. Lastly, these conditions being present, its application will be found most valuable in all cases in which, from any cause, *immediate delivery is indicated*. In cases of great disproportion between the foetal head and pelvic canal, where the whole vault of the cranium has to be broken up, and no further purchase can be obtained by any crotchet within the skull, the instrument under consideration may be

conveniently made use of as a vertebral hook. The trocar point should be inserted into the foramen magnum, when a slight projection of the crotchet will enable it to become fixed in the spinal canal, and a strong hold consequently obtained.

Article 27.—An interesting and instructive account is given by Dr. J. H. DAVIS, of a large *Fibroid Polypus*, pediculated at its base to the posterior margin of the os uteri, its neck protruding at the vulva. Removed by the single wire écraseur. The patient recovered quickly without a bad symptom.

Article 28.—J. B. CURGENVEN, Esq., reports in favour of the *Bromide of Potassium*, as a remedy in puerperal mania. In this drug, remarks Dr. C., we have an agent of remarkable power in allaying nervous irritability and procuring sleep, and hence its good effects in attacks of puerperal mania. He gave the article in doses of fifteen grains, every four hours, at first, and then one dose each night.

Article 29.—A *Case of Triplets*, related by Dr. C. H. J. ROUTH, presents one or two points of interest, apart from its being one of triplets: A deformity of the pelvis, which was probably in some measure the cause of the inertia uteri which necessitated manual interference. The delivery of the second child, in a twin labour of which the patient was the subject previously to this triplet case, a whole day after the first. An unusual occurrence, but which, doubtless, would have recurred on this occasion but for the resort to manual assistance. It is also quite within the range of possibility the children might not have been born for days after each other, and thus afforded another instance of what some regard, but erroneously, as evidences of superfœtation.

Article 30.—Dr. H. M. MADGE describes a *Case of Spina Bifida* with talipes varus of both feet. The child lived some seven months. The case is not one demanding on our part a more full exposition.

Article 31.—On the *Induction of Premature Labour by Injection to the Fundus of the Uterus*, by J. LAZAREWITCH, of Kharkoff, Russia. The object of the author of this paper is to prove that the surest methods of induction of premature labour are those in which the body or fundus of the uterus is excited. From the several considerations adduced by Dr. L. and the result of the twelve cases in which premature labour was induced, he concludes that when to this intent injection into the cavity of the uterus is resorted to, to secure the certainty and promptness of its action the fluid injected should approach as near as possible to the fundus of the uterus, this being the part of the organ most sensitive to irritations.

In the twelve cases related by Dr. S. ten required only one injection; in two a second injection was made, but only to augment the labour pains. The water, injected was warm, 28° R. In four cases six ounces were injected, in one five ounces, and in seven cases, four ounces. The labour pains commenced immediately after injection, except in one case, where it was delayed for some hours. The duration of the labour was from three and a half to thirty-six hours. Its mean duration from the time of injection to the termination of labour was about nineteen hours. In all cases the result was favourable to the mother, save in one. In this, however, death was not certainly the result of the operation, but of previous disease. Of the children, nine were born alive, one was still-born, and two died before the operation. In all cases the object of the operation was either partially or fully attained. In one case vomiting ceased after the operation, and the patient fully recovered; in another case convulsions ceased after the operation, and the patient convalesced. In two cases, though the pelvis was narrow, the parturition was normal—both mothers and children have since enjoyed good health. In one case the child was born alive, while in the two preceding pregnancies the fœtus died a fortnight before parturition. In two cases, the pelvis being exceedingly narrow, and in two previous births cephalotripsy being performed, by the induction of premature labour, a still-born child was extracted by the forceps in one and in the other a boy was born and lived several hours. In two cases, the operation being resorted to in consequence of disease of the mothers, cystitis in one case, metro-peritonitis in the other, after parturition the symptoms of disease diminished. In two cases, both epileptic, the parturition was normal and without fits, which considerably abated, and even for a long time ceased, after

birth. In the majority of cases no preliminary measures were taken; not even a bath was taken except in one. Attention was always paid to state of bowels. In all cases the operation was made with the greatest ease, and without causing pain; in five cases the patient felt the movement of the fluid in the abdomen, and sometimes a slight momentary pain at the epigastrium.

Article 32.—Account of a *Case of Imperforate Anus* in which the child lived upwards of ten weeks without relief from the bowel, after two unsuccessful operations, by Dr. W. F. CLEVELAND. On examination after death, it was ascertained that the rectum was pyriform in shape; at its lowest extremity there was an aperture about the size of a crow-quill, communicating with the posterior part of neck of bladder about a quarter of an inch above the urethral opening. It is surprising that by those who first saw the case, the relief of the infant was not attempted by the performance of Amussat's operation.

Article 33.—On the *Condition of the Uterus in Obstructed Labour*, and an inquiry as to what is intended by the terms "Cessation of labour-pains," "Powerless labour," and "Exhaustion," by Dr. J. BRAXTON HICKS. Of this long and most instructive paper we can afford room only for the *résumé* of the principal points desired to be established by the author.

1. It is very rare to find symptoms of *powerless labour* (Churchill) where the uterus is relaxed. 2. Where serious symptoms have begun, and at the same time the pains have apparently ceased, it will almost invariably be found that the uterus is in a state of continuous action. 3. The *continuous* action is the cause of the symptoms of powerless labour. 4. The time at which these symptoms arise varies considerably according to peculiarity of the patient, the violence of the action, and the position and presentation of the child. 5. If this constant contraction be fully established, it is better to deliver the child artificially, unless we first try the effect of chloroform. 6. The effect of the continuous action is exhausting to the mother, and liable to be fatal to the child. 7. The use of secale is contra-indicated in such cases. 8. Where the uterus is lax, we can generally wait a considerable time without danger to the mother or to the child. When the uterus has been allowed time to recover its nerve-force, then it is advisable to give some oxytocic, as secale, etc. If this fail, we may then draw down the head to the vulva slowly and cautiously, which will probably induce uterine action. The removal of the child must be done cautiously, and only as we find the uterus to respond.

Article 34.—*Case of Encephalocele*, by HEYWOOD SMITH. The tumour was situated at the posterior part of the head, its root occupying the whole of the occipital bone, save about from a quarter to a third of an inch of its anterior and lateral portions. The projection of the tumour equalled in extent about one-third of the size of the whole head. The infant was alive when exhibited, on the second day after its birth, to the Society.

Article 35.—*Case of Traumatic Aneurism of the Uterine Artery: Fatal Hemorrhage*. By Dr. GRAILY HEWITT. This case has been noticed in the number of this Journal for April, 1868, p. 550.

Article 36.—Report of a *Case of Cæsarean Section*, by Dr. D. LLOYD ROBERTS. The operation was performed in a case of distorted pelvis. The child, a girl, was born alive. The patient died, within a week after the operation, of peritonitis.

Article 37.—*On the Relative Value of the Various Substances which have been used in Dilating the Neck of the Womb*, with a plan for deodorizing spongetents, by Dr. J. H. AVELING. Dilating tents have been used from the earliest ages; the substances of which they have been made are very numerous. A long list of roots of vegetables have been used for this purpose. That of the *gentiana lutea* has been the longest and most employed. It dilates more rapidly and to a greater extent than most of the roots in use; it is also cheap and easily obtained, and readily cut into the desired form. Dilating tents have for many ages been made of the pith of canes and certain trees. Its friability, however, renders this an unsuitable and dangerous substance for the fabrication of tents, though, otherwise, in most respects everything that could be desired. The bark of the slippery elm is objectionable because of its brittleness, and slight and slow expansibility. Tents have been made of cotton, lint, tow, wool,

etc. These substances have no special advantages to compensate for their many disadvantages. The dried stem of the sea-tangle (*laminaria digitata*) has been used as a dilating tent; it is largely expandible, but hard, polished, and metal-like, so as to be with difficulty retained *in situ*. Under all circumstances, good, hard Turkey sponge presents by far the best material, and if it can with certainty be deodorized, its use is without any drawback. Mr. Ellis accomplished this end by means of carbolic acid, and Dr. Aveling by permanganate of potash. A conical piece of the sponge is transfixed in its long axis by a silvered knitting-needle, and tightly bound round with twine. When dry, the needle is withdrawn, leaving a tubular opening. After the tent has been filed into shape, and smoothed with sand-paper, its smaller end is sealed with a drop of melted white wax. The permanganate of potash, being very finely powdered, is now dropped within the tent in extremely small quantities at a time, and shaken down carefully. When the opening through the centre of the tent is filled, it is closed by another drop of wax. A thread of silk being passed through the end of the tent, it is ready for use.

"Until the tent has dilated to its very centre, the charge of permanganate, about two grains, remains undisturbed. It then gradually dissolves, and in solution renders the tent so perfectly sweet that, upon its removal, no unpleasant odour can be detected."

Article 38.—*Description of An Obstetrical Register*, by Dr. DRAPER MACKINDER. The register proposed by Dr. M. is certainly a very useful and well arranged one; but not more so than any of those in use among the practitioners of nearly all our larger cities.

Article 39.—Dr. A. HALL, of Edinburgh, describes an extraordinary *Case of Monstrosity*. Of the peculiarities of structure present in this case, no clear idea could be formed from any verbal description, unaccompanied by the drawings which are appended to the paper of Dr. Hall.

Article 40.—A case of *Puerperal Fever, or Puerperal Pyæmia*, after an abortion; with remarks by Dr. T. SNOW BECK. Already noticed in the number of this Journal for April, 1868, p. 551.

Besides the foregoing forty articles, the volume contains the addresses of the retiring President and his successor; notices of the presentation of certain new instruments; short notices of cases and operations; cases of abnormal organization; specimens of morbid structure, etc. D. F. C.

ART. XIX.—*Prof. Beale's Recent Histological Investigations.*

I. *New Observations upon the Structure and Formation of certain Nervous Centres, tending to prove that the cells and fibres of every nervous apparatus tend to form an uninterrupted circuit.* By LIONEL S. BEALE, M. B., F. R. S., Professor of Physiology and Morbid Anatomy in King's College, London, etc. 4to., pp. 31, with 8 plates and 46 figures. London: John Churchill & Sons, 1864. From Proceedings of the Royal Society.

II. *New Observations upon the Minute Anatomy of the Papillæ of the Frog's Tongue.* By LIONEL S. BEALE, M. B., F. R. S., etc. 4to., pp. 14, with 2 plates and 23 figures. From Proceedings of the Royal Society, 1864.

III. *Indications of the Paths taken by the Nerve-currents as they traverse the Caudate Nerve Cells of the Spinal Cord and Encephalon.* By LIONEL S. BEALE, M. B., F. R. S. 8vo., pp. 10. From Proceedings of the Royal Society for 1864.

IV. *Notes of Observations to ascertain the Ultimate Distribution of the Nerves of Gustation; their Ultimate Distribution not Terminal.* By R. K. BROWNE, M. D., Professor of Physiology and Microscopic Anatomy in N. Y. Dental College, etc. 8vo., pp. 11, with a plate.

I. It is impossible to give a correct idea of the researches detailed in the above papers by Dr. Beale, without presenting the rare and beautiful illustrations by which they are accompanied. Reference has already been made in a previous

notice of one of his works, to the method of Dr. Beale, which is to draw his own illustrations from objects as they appear under the microscope, by means of the drawing prism. The accuracy thus attained by a conscientious observer cannot be equalled by any other method, and observation has been much aided by the reiterated stress laid upon such methods in the various papers and text-books of Dr. Beale. A single but great obstacle lies in the expense of reproducing these drawings in woodcut or lithograph. This is also in a measure obviated by making the drawings primarily upon stone; a plan also practised and recommended by Beale.

Beale holds, in opposition to Kölliker, that unless the supposed difference in the arrangement of a particular structure, as terminal nerves, be associated with a fundamental difference in the minute structure of the tissue supplied by or under the immediate influence of such particular structure, the arrangement of the latter in one animal is its arrangement in another. Thus, if nerve fibres terminate in ends on the sarcolemma of the muscles of frogs, they terminate in ends on the sarcolemma of the muscles of the mouse. That in one case there may be more ends than in another, and there may be all sorts of modes of branching at different angles, etc.; but that no fundamental difference exists in the arrangement of nerve fibres in corresponding tissues of different animals.

"So, admitting, as we must, that by far the majority of ganglion cells in different nervous centres have more than one fibre in connection with them, it seems to be more reasonable to conclude that these cells which appear to have, and those in connection with which no fibres whatever have been demonstrated, have really two or more fibres connected with them, but too fine to be demonstrated by ordinary means, than to accept the ordinary inference that there are, in the very same part or organ, three distinct classes of nerve cells, exhibiting as many fundamental differences of relation to fibres as they are supposed to influence."

Without admitting a complete parallel between these two sets of probabilities, we see not why the latter should not be admitted if a sufficient number of accurate anatomical observations can be brought to bear upon the subject. This appears to have been done by Dr. Beale, who has studied the question in different parts of the nervous system, and in different animals, from the mammalia to the annellida, whence he feels justified in drawing the following conclusions:—

"1. That in all cases the fibres are in bodily connection with the cell or cells which influence them. and this from the earliest period of their formation.

"2. That there are *no* apolar cells, and no unipolar cells in any part of the nervous system.¹

"3. That every nerve cell, central or peripheral, has at least two fibres in connection with it."

The observations upon which these conclusions are based have been made with the aid of powers of from 700 to 1800 and even 2800 diameters, and although limited to the cells of the ganglia in different parts of the body of the frog, involve the consideration of fundamental principles with regard to the minute structure of this highest of the animal tissues.

1. As to the *general description of ganglion cells*, all exhibit the same general structures, with many special peculiarities and great differences in size. Their general form "is oval or spherical; but on closer examination the most perfect ganglion cell is more or less pear or balloon-shaped, continuous by its narrow extremity with nerve fibres which may be followed into nerve trunks." The substance of the cell is more or less granular, and generally, near the round

¹ This statement is reiterated in some remarks upon the structure of nerve fibres contained in the fourth and last edition (1868) of "How to Work the Microscope," where Dr. Beale states: "Many observers, however, still maintain that the appearance (mode of connection of the ganglion cell with the fibre) is due to the ganglion-cells being inclosed in a capsule of connective tissue, and assert that some cells exist from which no fibres whatever proceed. These strange notions are still taught in many of our most celebrated text-books, and are erroneously forced upon the mind by the repetition of old figures." (p. 129, a. f.)

end is contained a large circular nucleus with its nucleolus, in addition to which are sometimes a number of small oval nuclei, arranged transversely to the long axis of the cell. The matter of the mass of the cell gradually diminishes in diameter, and contracts so as to form a fibre in which a nucleus is often seen. At the *circumference* of the cell, about its centre, the material gradually seems to assume the form of fibres, which contain numerous nuclei, and *these pass around the first fibre in a spiral manner*. Thus a fibre comes from the centre of the cell (*straight fibre*), and one or many fibres (*spiral fibres*) proceed from its surface. *Neither of the fibres can be traced to the large nucleus of the cell.*

2. As to the *formation* of the ganglion cell (p. 5) it does not, at all ages, possess a well-defined cell wall, cell contents and nucleus, but always consists of *matter that is living*, and *matter that has lived*, germinal matter, and formed material, the first stained by an ammoniacal solution of carmine, the latter not. It is this germinal matter which is usually termed the nucleus, of which the nucleolus is but a younger portion, and assumes a deeper tinge of red by carmine.

In very young animals these ganglion cells form (*a*) nuclei or centres of germinal matter imbedded in soft granular matter.

Fibres extend from these collections in at least two directions, but *do not grow out* from the cells, but are formed as two masses of germinal matter gradually separate from each other, leaving a fibre of formed material between them. It is important to understand this, as it is in this way that all nerve fibres are developed, according to Beale. A cell or mass of germinal matter surrounded by a variable quantity of formed material is present. From the abundant supply of pabulum, it grows rapidly and finally subdivides into two masses. These, as they approach their fully developed form, acquire formed matter upon their periphery, and gradually move away from each other, though *they do not actually sever their connection*, which is kept up, as it were, by a thread of formed matter which *constitutes* the nerve fibre; as the cells further separate, the fibre is elongated or grows in length.

Ganglion cells are also formed (*b*) by changes similar to those described in young animals, by the splitting up of a mass like a single ganglion cell, increasing thus in *number* as well as *size*; and (*c*) by changes in what appears to be a nucleus of a nerve fibre. These latter "changes occurring during the formation of a single ganglion cell, in connection with what is undoubtedly at first a single granular fibre, are of the utmost interest." Though Dr. Beale candidly admits that he cannot be perfectly confident that the history he gives of the changes is absolutely true in all points of detail—this is partly due to the difficulty in isolating fine fibres with nuclei exhibiting the different stages of change, and partly to the difficulty in finding specimens in which such fibres are observed. A nucleus, not perhaps any nucleus connected with a nerve fibre, but a nucleus in no way peculiar, grows somewhat larger than the rest, which, at this stage, is of course bipolar, or has a fibre springing from each end. But this only, according to Beale, as a "*young and imperfectly formed*" cell.

3. From this point of formation further changes in the ganglion cell take place similarly, regardless of the mode of origin. "The two opposite extremities of the cell are drawn down. The fibres increase in length and lie parallel to each other, and the form of the cell becomes much altered." Finally, the one fibre assumes in position the relation of a spiral to the other, and the ganglion cell as described results. Subsequently the two fibres, after assuming various positions in relation to a bundle of nerve fibres, alter their course and run with the other fibres of the bundle, *but in opposite directions*, though from their extreme tenuity ($\frac{1}{50000}$ of an inch in diameter), it is very difficult to follow them, and they are apt to break off close to the cell to give the appearance of an *apolar cell*, while the fibres which were continuous might be mistaken for *connective tissue fibres*, modified forms of which they are erroneously claimed by some to be.

4. With regard to the *spiral fibre*, in all but very young ganglion cells, it exists necessarily of greater length than the straight fibre, and eventually takes a course in the compound nerve trunk *opposite* to that of the straight fibre,

with which it may have been for a certain distance parallel. The spiral fibre is also continuous with the periphery of the cell while the straight is continuous with the body, and *the spiral* may, as the *straight*, have nuclei connected with it.

Beale believes its relation to the straight fibre to be caused by a *rotation* of the peripheral part of the cell around the central fibre. In this connection, as an important fact, Beale states, that "whenever any compound nerve trunk, large or small, composed of any form or number of nerve fibres in any part of the organism of man or animals, passes into another trunk running at, or nearly at right angles to it, its component fibres divide into branches which pass in opposite directions."

5. As to the *essential nature* of these changes, the nucleus everywhere takes an important part; hence its large size in young cells. This nucleus or mass of germinal matter, at first constituting the entire mass of the cell, undergoes conversion into formed material, resulting, as stated, in the formation of nerve fibres as well as ganglion cells.

6. But it must be remembered that neither the nucleus, nucleolus, or still younger centres of germinal matter within the latter, which may be called "nucleoluli," possess peculiar powers or actions upon matter around them; *nor is the nucleus essential to the being or multiplication of the elementary part or cell.* And here we may take advantage of an explicit statement of Beale in this paper, to correct an error which has crept into the notions of many who have studied the theory of Beale; and this is that the nucleus and its contents correspond exactly, or are the only germinal matter of the cell. He says: "The matter around the nucleus differs from the nucleus itself only in having reached a further stage of existence. The whole of the germinal matter of which the young cell is almost entirely composed, may divide and subdivide, and from it any number of new cells may be produced. Nor is it necessary that a nucleus should be present in the detached portion; the nucleus is often not to be distinguished until some time afterwards. This fact may be observed in the germination of pus and mucus." The nucleus *may* be the only germinal matter present in a cell, it is *always* a *part* of the germinal matter and may be the whole of it. So too the formed material may or may not form a cell wall, it may form a nerve fibre, a muscular fibre, wall of a capillary, etc. The germinal matter is simply the intermediate living state through which all pabulum must pass before it becomes tissue.

7. As to the fibres in the nerve trunks continuous with the straight and spiral fibres of the ganglion cells in the frog, Beale arrives at these conclusions:—

"1. That in some instances very fine fibres, not more than $\frac{1}{80000}$ of an inch in diameter, are alone continuous with the straight and spiral fibres of the ganglion cell.

"2. That a dark-bordered fibre may be traced to the ganglion cell as the straight fibre, while the spiral fibres are continued as very fine fibres.¹

"3. That spiral fibres may be continued onwards as dark bordered fibre, which may be wider, at least for some distance, than the fibre continued from the straight fibre.

"4. Both straight and spiral fibres may be continuous with dark bordered fibres."

But when a ganglion cell is developed upon a nerve fibre already formed, Beale considers that it cannot be regarded as a centre from which two nerve fibres proceed direct to their peripheral distribution, but as a *centre placed at*

¹ It may be appropriate to give in this connection a definite notion of what is intended by Dr. Beale by "dark bordered" and "pale or fine nerve fibres." By the former he intends the nerve fibre as ordinarily defined, and consisting of the tubular membrane, white substances of Schwann, and axis cylinder, the presence of the second highly refracting constituent giving rise to a dark double contour familiar to all who have examined the fibrils of a spinal nerve. The latter term he applies to nerves which in their minute ramifications have parted with the insulating white substance, and consist only of the axis cylinder or band of Remak. They are identical in composition and appearance with the pale gray or sympathetic nerve fibres.

a part of a circuit which existed as a complete circuit before the ganglion cell was developed in connection with it. If this be the case, a question arises as to the function of the ganglion cell under these circumstances. Does it become a mere conveyer of impressions and motor influences, or does it retain these functions usually assigned to ganglion cells, of receiving and originating influence? If the former, its development would appear purposeless, and if the latter, the existence of the two nerve fibres, *afferent* and *efferent*, appears essential.

8. As to the *ganglion cells of the heart*, Beale states as the result of numerous observations, that: 1. There are no apolar cells, either in the ganglia of the heart or in those of the bladder of the frog. 2. The unipolar cells of Kölliker have really two or more fibres proceeding from them, so that, according to Beale, the statement of Kölliker that "all the cells connected with nerve fibres send out but a single fibre" is not a fact. 3. Some fibres pass in a central direction; so that Kölliker's statement that all the fibres pass in a peripheral direction is also erroneous.

9. Of the *ganglion cells and nerve fibres of the arteries* we are informed that in nerve trunks running near the branches of the arteries of the palate, and in connection with the arteries of the different viscera of the abdomen, heart, and lungs, and bladder of the frog, ganglion cells and ganglia are found in considerable number. From these, fibres are traceable to the coats of the arteries and even among the muscular fibre cells of arteries $\frac{1}{1000}$ of an inch in diameter. It is even possible that nerve fibres are distributed to the lining membranes of an artery, though Beale has not been able to satisfy himself of this fact; but in the auricles of the heart and commencement of the cava, very fine nerve fibres are certainly distributed very near to the internal surface, being separated from the blood only by a very thin layer of transparent tissue. These nerves invariably form networks with wide meshes. It is stated, also, that the nerves which supply the small arterial branches in the voluntary muscles of the frog come from the very same fibres which are distributed to the muscles. Dr. Beale has seen a dark bordered nerve fibre divide into two branches, one of which ramified upon an adjacent artery, while the other was distributed to the elementary fibres of the muscle. Can Dr. Beale intend by this to convey the impression that nerve fibres are supplied to bloodvessels from the cerebro-spinal system, in addition to the fibres from the sympathetic system, or in exclusion of them?

10. As to the *connection of ganglion cells with each other*, it is deemed almost certain by Dr. Beale, that, in many cases, ganglion cells of one ganglion are connected by fibres with cells of another ganglion even after development is complete.

11. On the subject of the *cell wall*, or "*capsule*" of the ganglion cell, and especially of the *connective tissue and its corpuscles*, Dr. Beale makes some important statements. At an early period of the life of the ganglion cell there is no proper cell wall, it is all germinal matter; the cell may form protrusions at various parts of its surface, like a young epithelial cell or mucous corpuscle, which, on being detached, may give rise to the formation of a new cell. As it grows older, the cell becomes surrounded by a transparent substance, which, in some instances, assumes a definite outline, and may be termed a cell wall, while in others it would be more correctly described as a matrix.

With regard to the possibility of distinguishing the finest nerve fibres from connective tissue, Beale says: "Although it is undoubtedly true that in preparations mounted in certain fluids, it is not possible to distinguish the finest nerve fibres from connective tissue, this distinction can most clearly be made out in some of my specimens." Again: "All fibres which can be followed for a considerable distance, which refract like true nerve fibres, and exhibit an appearance more or less granular, especially if they can be followed into ganglion cells, must clearly be pronounced nerves. The finest nerve fibres may often be followed amongst the connective tissue for a long distance, and their relation to other structures most positively determined." (pp. 22, 23.)

This is truly encouraging to workers in a most difficult subject, and should at least incite them to test the efficacy of Beale's method of preparation, as published in his text-books.

But there are certain indefinite forms of connective tissue immediately sur

rounding nerve fibres and ganglia, which give rise to greater difficulty in deciding the true nature of the fibre or corpuscle of germinal matter. There are forms of connective tissue corpuscles which originate in the multiplication of *nuclei of ganglion cells*, of which nuclei those lying upon the surface of the nerve fibre are only able to produce a low form of connective tissue, which accumulates around the nerve centres. It will be recollected, also, that Beale suggests a somewhat similar origin to certain of the cord-like fibres of the so-called yellow elastic tissue which resist the action of acetic acid, and which constitutes an element of ordinary connective tissues. These he believes to be degenerated nerve fibres. He informs us, also, that not nervous tissues alone, but *structures no less special than a uriniferous tube, or a portion of the cell containing network of the liver may waste, and all that represents it will be what is termed connective tissue and connective tissue corpuscles*. Thus, connective tissue and connective tissue corpuscles are produced from the very same masses of germinal matter as those from which nerve cells and nerve fibres are produced.

It should also be stated in this connection, that according to the views of the German anatomists, the "nucleated fibres" which seem almost to encircle many of the nerve cells of mammalia, and which correspond, according to Beale, to the "nucleated spiral fibres" described by him in this paper, are considered "nucleated connective tissue." Such views Beale attributes to methods of preparation, and says, moreover, that "there is little doubt that when the changes occurring during the development of special tissues shall have been patiently worked out by the use of high powers and better means of preparation, opinions on the connective tissue question will be completely changed. *The idea of the necessity for a supporting tissue or framework will be given up*, and many structures now included in 'connective tissue' will be isolated, just as new chemical substances, year after year, are being discovered in the indefinite extractive matters." (p. 25.)

"It is remarkable how positively many authorities deny the existence of structures they have failed to demonstrate. Such a course is only justifiable on the presumption that the art of demonstrating structure has arrived at perfection; but we know, on the contrary, that it is but in its infancy. Surely it is premature to maintain that the vessels of the umbilical cord are destitute of nerve fibres, because we may have failed to demonstrate them—that the fibres of voluntary muscle only receive nervous supply at one point, because authorities will not admit that nerve fibres may exist which are too delicate or too fine to be demonstrated by the means they may have employed—that the spindle-shaped fibres of organic muscle generally are not supplied with nerves, because they cannot find them—that the fibres prolonged from the large cells in the cord and in the brain are not continued into fibres, because they have failed to trace them for any considerable distance."

"I think I can convince any one, by positive demonstration, that the last three positions are untenable; while there is every reason to believe that certain *elongated nuclei and fibres* which are to be seen amongst the *muscular fibre cells of the umbilical arteries*, and on the *smaller vessels of the placenta*, really belong to the *nervous tissue*." (pp. 25, 26.)

In a similar manner Dr. Beale also writes in the last edition of "How to Work the Microscope," already referred to. "In Germany, for many years past, many anatomists have been trying to reduce everything to what they call connective tissue, which, to any ordinary observer, would appear to be the least important tissue in the organism. It is even now a matter of the utmost difficulty to get a fair hearing if you attempt to extract anything real and definite out of the favoured indefinite connective tissue. In spite of all this, however, it has been clearly proved that Remak's fibres are true nerve fibres, and that dark-bordered nerve fibres, before they reach their ultimate distribution, *invariably assume the pale granular appearance of Remak's fibres*."

II. In the second of the papers of Dr. Beale, he gives the results of some recent investigations upon the minute anatomy of the beautiful fungiform papillæ of the tongue of the little green tree-frog (*hyla arborea*). In these researches

he has made use of the $\frac{1}{25}$ objective magnifying 1700 diameters, and $\frac{1}{50}$ magnifying 3000.

As recent contributors upon this subject are named Waller, Billroth, Hoyer, Axel Key, and Hartmann, among whom Axel Key is stated to have approached nearest to the truth.

Beale has not, however, been able to verify his views (Axel Key's) as to the presence of two kinds of cells at the summit of the papilla, epithelial and special cells, concerned in taste—nor his delineations of the abrupt cessation of the white substance, the prolongations of the axis cylinder and its division into fibres far too fine to be visible by the magnifying powers employed; while, on the other hand, Axel Key has not demonstrated the peculiar network at the summit of the papilla so distinctly seen in Beale's specimens.

Hartmann's method of preparation is stated by Beale to be utterly destructive of normal appearances, and in common with other methods pursued in Germany calculated to retard rather than advance anatomical inquiry. It consisted in soaking the tissue for three days in solution of bichromate of potash, and then adding solution of caustic soda.

The structures entering into the formation of the papilla are: "1. The connective tissue which forms the body of the papilla. 2. The epithelium. 3. The nerve fibres in the body of the papilla, and the fibres prolonged from them which form a plexus upon its summit. 4. Nerve fibres ramifying in the connective tissue, upon the capillary vessels and upon the muscular fibres. 5. The muscular fibres. 6. The vessels."

1. The connective tissue is exceedingly delicate and transparent, and the majority of the nuclei are undoubtedly connected with the nerves, bloodvessels, and muscular fibres imbedded in it, though a few seem to belong to the connective substance alone and are properly termed "*connective tissue corpuscles*;" though even these, at an earlier period, may have been connected with nerves or muscles, and especially nerve fibres which were in a state of functional activity at an earlier period of life. To such connective tissue the term "indefinite connective tissue" is given throughout Beale's papers. This accumulates, but slowly undergoes condensation as the organ grows older.

2. *The epithelium* upon the summit of the papilla of the frog's tongue differs from that attached to its sides, that covering the simple papillæ and on the surface of the tongue generally. They are *not ciliated cells*, from which they differ additionally in being smaller, in possessing larger nuclei, and in not being easily separated from each other.

3. *The nerves*.—1. The bundle of nerve fibres distributed to a papilla always divides into two bundles which pursue opposite directions. 2. Fine pale nerve fibres pass from the same trunk of dark-bordered fibres which give off the bundle of nerves to the papilla.

These fine fibres ramify among the *muscular fibres* of the tongue, upon the *vessels* and in the connective tissue of the tongue generally, and in the simple papillæ.

The fibres in the axis of the papilla are dark bordered, and as they ascend towards the summit the *individual* fibres divide and subdivide into finer branches. These, according to Beale, do not possess an axis cylinder as a structure distinct from the white substance, which does not cease, as stated by some, but the entire fibre divides and subdivides. "In fact, dark-bordered nerve fibres, near their ultimate ramifications, always consist of fatty albuminous material imbedded in a transparent matrix of connective tissue. The tubular membrane, white substance, and axis cylinder can never be demonstrated as distinct structures near the peripheral distribution of nerves. *The tubular membrane is nothing more than the transparent matrix in which one or more nerve fibres are imbedded.*"

These finer dark-bordered fibres again subdivide about the level of a ring or half ring of capillaries at the summit of a papilla, and form as the result of their subdivision fibres so exceedingly transparent that they are usually lost to view at this point, and in Hartmann's figure it is to this point only that nerve fibres are continued. According to Beale, however, "it is most certain that the fibres do divide and subdivide into finer fibres and much more transparent fibres at this

point, and that these again divide and subdivide and form an elaborate plexus on the summit of the papilla which has not been before described."

From the upper part of these fine nerve fibres interlacing in the most intricate manner, but so minute as to appear a granular mass except under a power of 1000 or more, fibres may be traced into a hemispheroidal layer of peculiar epithelium-like cells, or masses of germinal matter which must be regarded as a part of the nervous apparatus, and in connection with the very fine fibres constitute a "peculiar organ belonging to the nervous system." They bear the same relation to the intervening nervous structure as the nucleus of a nerve bears to its fibre or of an epithelial cell to its wall. This plexus he believes to be formed, not at the extremity of a nerve and constituting thus a terminal network, but to form part of the course of a nerve or nerves, and constituting a part of a continuous circuit or of continuous circuits.

4. Nerve fibres ramifying upon the capillary vessels, in the connective tissue and upon the muscular fibres.—*They come off from the very same trunk as that from which the bundle of purely sensitive fibres which terminate in the papillæ are derived.* Among these are many of the so-called connective tissue corpuscles and their anastomosing processes. Of these, the nerve fibres around the capillaries and in the connective tissue of the papilla are considered by Beale as sensitive, excitor, or afferent nerves, corresponding to which those supplying the muscular coat of the small arteries are the efferent or motor nerves.

5. The *muscular* fibres of the papilla are the continuations of muscular fibres in the substance of the tongue, and are excellent examples of branching striped muscle. Branches less than $\frac{1}{1000}$ of an inch in diameter exhibit the most distinct transverse markings; these, however, gradually cease, and the fibre becomes a mere line, which is lost in the connective tissue of the summit of the papilla. They are formed from the nuclei or masses of germinal matter which they contain, which move along the surface of the already formed muscular tissue, and as they move a part of their substance is converted into contractile tissue, while they themselves maintain about the same size, because of the pabulum they absorb and convert into structure like themselves.

6. The *capillaries* of the papilla of the frog's tongue are remarkable for their size, and form a complete vascular ring at the summit of the papilla. They are developed from oval masses of germinal matter situated at intervals in the transparent tissue of the wall, generally upon its external surface, but sometimes projecting slightly from the inner surface of the vessel into its interior. A most interesting point in connection with their anatomy is the presence of very fine nerve fibres forming a lax network about the capillary, and which have been previously regarded as connective tissue fibres and corpuscles. Dr. Beale has not succeeded in demonstrating lymphatics in the papillæ of the frog's tongue. The conclusions which are attained as the result of these observations are thus stated:—

1. That the fine nerve fibres ramify in the connective tissue of which the simple papillæ are composed, and that connected with these nerve fibres are oval masses of germinal matter or nuclei, which are usually regarded as connective tissue corpuscles.

2. That neither the epithelial cells of the frog's tongue generally, nor those covering the simple papillæ are connected with nerve fibres.

3. That the mass consisting of epithelium-like cells on the summit of the fungiform papilla, is connected with nerve fibres, but it is not an epithelial structure.

4. That the dark-bordered sensitive fibres constituting the bundle of nerves in the axis of the papilla divide near its summit into numerous fine branches, with which nuclei are connected. Thus is formed a plexus of exceedingly fine fibres on the summit of each papilla; from this network numerous fine fibres may be traced into the special *nervous* organ, composed of epithelium-like cells on the summit, with every one of which nerve-fibres appear connected.

5. That the bundle of nerve fibres distributed to a papilla always divides into two bundles which pursue opposite directions. The divisions may take place at the base of the papilla or at some distance from it.

6. That fine, pale nerve fibres pass from the same trunk of dark-bordered

fibres as that which gives off bundles of nerves to the papilla. The fine fibres ramify—

a. Among the muscular fibres of the tongue.

b. Upon the vessels.

c. In the connective tissue of the tongue generally, and also in the simple papillæ.

7. That the fine nucleated nerve fibres ramify freely among the delicate branching muscular fibres of the papillæ, and form plexuses or networks which exhibit no nerve ends or terminations, nor in any case does a nerve fibre penetrate through the sarcolemma or investing tissue of the fibre, or connect itself with the nuclei of the muscle. As many of the muscular fibres are so very fine and narrow the distribution of the nerves and their exact relation to the contractile tissue can be demonstrated very distinctly in the case of the muscles of these papillæ.

III. In the third paper, Dr. Beale premises that the so-called caudate nerve vesicles or cells existing in the spinal cord and medulla oblongata are neither "cells" nor "vesicles" in the ordinary acceptation of these words, for there is no proper investing membrane, neither are there "cell contents" as distinguished from the "membrane" or "capsule"; the so-called cell consists of soft solid matter throughout, from which the nerve fibres are prolonged and partake of its chemical nature, and not from the nucleus or outer part of the cell. Thus, in these caudate cells we recognize only the so-called "nucleus" (germinal matter) and matter round this (formed material) which passes into the "fibres" which diverge in various directions from the cell.

The special object of the author is to call attention to a peculiar appearance he has noted in these cells, whence he is enabled to draw important "inferences with reference to the connections and actions of these very elaborate and most important elements of the nervous mechanism."

In some very thin sections of the cord and medulla of a young dog, which had been slowly acted upon by acetic acid, there was observed an appearance as if the fibre were composed of several very fine fibres imbedded in a soft transparent matrix, which fibres, being stretched, had been broken transversely at very short intervals. At the point where each large fibre spreads out to form the body of the cell, these lines diverge and pursue different courses through the very substance of the cell, in front of, behind, and around the nucleus. Lines can be traced from each fibre across the cell into every other fibre passing away from it. These singular appearances the author believes due to some difference in composition of the material forming the substances of the cell in these particular lines. And the explanation of their presence he offers, is that they "*result from the frequent passage of nerve currents in these definite directions.*" He concludes that, at first, the formed material of the cell is quite soft and almost homogeneous, but by the traversing of the currents in certain definite lines, difference in composition and texture results in these lines, and after awhile they become more or less separated from one another, and insulated by intervening material.

The arguments he adduces in support of nervous currents are based upon new facts resulting from observations upon—*a*, the peripheral arrangement of the nerves in various tissues; *b*, the course of individual fibres in compound trunks, and the mode of branching and division of the nerve fibres; and *c*, the structure of the ganglion cells. And these lines across the substance of the caudate nerve cells he considers as another remarkable fact in favour of the existence of such circuits, principally on the ground of the impossibility of another explanation which would seem even plausible.

These markings, he believes, also, completely upset the view that nerve force passes centrifugally from one cell as a centre towards its peripheral destination. "So far from the fibres *radiating from one cell*, or from the nucleus, as some suppose, in different directions, all the fibres which reach the cell are complex and contain lines which pass uninterruptedly *through it into other fibres*. Instead of the cell being the point from which nerve currents radiate in different directions along single fibres, it is the *common* point where a number of circuits

having the most different distributions intersect, cross, or decussate. The so-called cell is a *part of a circuit*, or rather of a great number of circuits."

Dr. Beale has also reason to suppose that every single nerve fibre entering into the formation of the trunk of a spinal nerve, is really made up of several fibres emanating from different, and perhaps distant, caudate cells. The individual fibres, exceedingly fine ($\frac{1}{100000}$ of an inch in diameter, or less), after a variable distance and in variable number, coalesce to form one trunk or axis cylinder around which the protective white substance of Schwann collects; then, at the periphery, the subdivision of this dark bordered fibre again occurs until peripheral fibres result as fine as the central component fibres.

From these facts Dr. Beale ventures to conclude "that the typical anatomical arrangement of a nervous system is *not a cord with two ends—a point of origin and a terminal extremity—but a cord without an end, a continuous circuit.*"

It is important, also, to state that the author makes two distinct sets of nerve cells in connection with nervous systems, and possessing different functions—the *rounded ganglion* cells, which are the sources of nervous power, *originating* currents, and the caudate nerve cells concerned more particularly in the *distribution* of these and of secondary currents induced by them in many different directions. Whence "it seems probable that nerve currents emanating from the rounded ganglion cells may be constantly traversing innumerable circuits in every part of the nervous system, and that nervous actions are due to a disturbance, perhaps a variation in the intensity of the current, which must immediately result from the slightest change occurring in any part of the nerve fibre, as well as from any physical or chemical alterations taking place in the nerve centres, or in the peripheral nervous organs." (p. 8, a, f.)

We have given these views without comment, because we have felt that, emanating as they do from one of the acknowledged authorities of the present day, they should be widely disseminated, that they may meet the eyes of those who are qualified to confirm or refute. As to ourselves, we are not prepared to receive this interpretation of the markings described. That the transmission of an influence—term it "current," if you please—which is totally intangible so far as physical phenomena are concerned, and, indeed, incapable of existence except in connection with a living organism, should produce markings of the nature described in the apparatus through which it passes, seems to us much more unreasonable than to suppose them produced during the natural metamorphosis of germinal matter into formed material, just as the delicate longitudinal striæ seen in the otherwise structureless capillary wall is admitted by Beale to be produced in its formation from the nuclei or masses of germinal matter.

IV. The body of Dr. Browne's paper is taken up by a summary of the views already given of Beale upon the minute anatomy of the papillæ of the frog's tongue, preceded by the description of an experiment by Dr. Browne, making conclusive Bernard's view with regard to the relation of the chorda tympani to the functional activity of the submaxillary and sublingual glands. The author writes, quoting Bernard, "that a desideratum still exists, an anastomosis is formed between Jacobson's nerve and the chorda tympani, above the point on which we are to divide it; and that to ascertain whether Jacobson's nerve exercises any influence on these secretions, it would be necessary to divide the ninth pair in the immediate vicinity of its cerebral origin—an experiment of such difficulty that no physiologist has hitherto attempted to perform it." This operation was, however, successfully performed in the dog by Dr. Browne, by partly drilling and partly excavating through the posterior portion of the occipital bone, and passing inward and downward a suitable instrument between the dura mater of the lateral border of the cerebellum and the corresponding portion of the interior of the skull to the situation of the nerve. This accomplished on either side, the following results were observed:—

1st. No impairment of the power of deglutition, either in eating or drinking. Lapping of fluid was performed as usual.

2d. The common sensibility of the posterior two-thirds of the posterior third

of the tongue was lost, and with it the sensibility to taste of this part. Taste was intact in the anterior two-thirds.

3d. The ducts of the submaxillary and sublingual glands having been exposed in the manner described by Bernard, the function of these glands was found perfect.

Whence it appeared that the ninth pair exerts no influence on the secretory function of the submaxillary and sublingual glands, and that the filaments derived from the chorda tympani branch of the seventh pair, alone exert the nerve influences on the secretory function of these glands.

The writer also concludes, that since deglutition is performed equally well after section of the ninth pair or glosso-pharyngeal at its cerebral origin, the impression which leads to this action is due to the gustative or lingual branch of the fifth pair and not to the former as invariably alleged. Again, since section of the ninth pair at this point is attended by *no* disturbance of *motor power* the motor influence of this nerve, admitted in deglutition, must depend wholly upon the fibres of communication received from the *facial* (seventh) and *spinal accessory* (eleventh.)

J. T.

ART. XX.—1. *Croonian Lectures on Matter and Force*. Delivered at the Royal College of Physicians. By HENRY BENGE JONES, A. M., M. D., F. R. S. (*British Medical Journal*, Nos. 382, 383, 384, 385, 1868.)

2. *Address on the Relation of Food to Work done by the Body; and its bearing upon Medical Practice*. Delivered at the meeting of the British Medical Association, at Oxford. By the Rev. S. HAUGHTON, M. D., D. C. L. Oxon., F. R. S., etc. etc. (*British Med. Journ.*, Aug. 15, and 22, 1868.)

1. DR. JONES's lectures are devoted to the consideration of a somewhat recondite subject, but one of extreme importance, and which, if thoroughly investigated, especially in connection with that of the relation of food to work done by the body—a question ably treated by Dr. Haughton, and which will be presently noticed—must lead to a clearer comprehension of the operations of the animal economy, and give greater precision and efficiency to therapeutics. To fully comprehend the import of these discourses, more than ordinary attention may be required—they must be studied, not cursorily read—but we trust that no one will be deterred by this from undertaking the task, for those who accomplish it will be amply repaid for their labour.

In his first lecture, Dr. Jones points out the three stages which our ideas have undergone regarding the union of matter and force in the physical, or as he calls them, “the abiological” sciences.

The first or primitive stage is that of complete separation between the ideas of matter and force. He shows that before any knowledge of science existed, the ideas of force and matter were formed on superficial likenesses and distinctions, and that even to a late day our ideas of force or fire were entirely separable from our ideas of the three different conditions in which matter may occur—solid, liquid, and gaseous.

The second or transition stage of ideas consists in an incomplete separation between the ideas of matter and force. In this stage, force is considered as altogether separable from ponderable matter, but perfectly inseparable from an imponderable ether, or gas, or fluid, which is capable of being attached for a time to the imponderable matter. Dr. Jones traces the idea that force is imponderable matter to Kepler, who first started it, and presents the views subsequently entertained by Descartes, Leibnitz, Newton, Whewell, Young, Fresnel, Faraday, &c.

In the third, or modern stage, there is complete union, and no possibility of any separation between the ideas of matter and force. “The absolute union—the complete inseparability of our ideas of matter and force,” observes Dr. J., “is most apparent in our ideas of matter and chemical force. A molecule has been endowed with a force which gives rise to its various chemical qualities,

and these never change either in their nature or in their amount. Mr. Faraday says, 'a particle of oxygen is ever a particle of oxygen—nothing can in the least wear it. If it enter into combination, and disappear as oxygen—if it pass through a thousand combinations, animal, vegetable, and mineral—if it lie hid for a thousand years, and then be evolved, it is oxygen with its first qualities. Neither more nor less. It has all its original force, and only that; the amount of force which is disengaged when hiding itself has again to be employed in a reverse direction when it is set at liberty.' (Faraday, *Researches in Chemistry*, p. 454.) If it were possible to take the ultimate atom of any one of the elements, we should find that the chemical force which constitutes and determines its nature, would be absolutely inseparable from the matter of which the element consists. For example, the ultimate atom of carbon would have the same kind of force as any mass of carbon, and it would differ in kind, and always from the ultimate atom of any other element, because of the peculiarity of its force. If the chemical force could be separated from the atom of carbon, the matter might cease to be carbon, and might become some other element, and the transmutation of metals might then be possible. The union, also, between matter and gravity is just as inseparable as the union between matter and chemical force. Matter without weight is not matter at all; the weight belongs to the matter, and cannot be taken from it. The gravity can no more be destroyed than the matter itself can be destroyed. However small the matter may be divided, yet each part will have a part of the force, and there can be no more of the force lost than of the matter. We cannot think that the matter can exist without the force of gravity being always acting or ready to act in each atom of it. Nor can we think that any portion of the force of gravity can be separated from the matter. If we mentally attempt to divide any amount of the force into its constituent portions, then every portion, however minute, of the force, must have a corresponding portion of matter to which it is inherent, and without which the force cannot be thought to exist.

"Newton's great discovery consisted in determining the existence of force in each particle of the matter of the earth and the planets; and Adams and Leverrier, recognizing the action of a force not accounted for in the matter that was known, predicted the existence of unknown matter in an undiscovered planet which was looked for and found. The great advance, however, towards the modern stage of ideas regarding the inseparability of matter and force, is owing to Young and Fresnel, who overthrew the second stage by their discoveries regarding light."

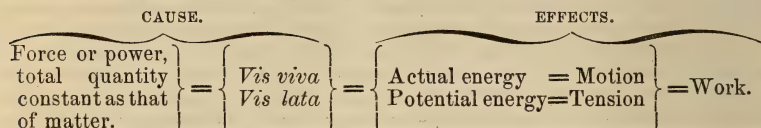
These discoveries, with the investigations of others in regard to heat, electricity, and magnetism, show that they as well as light, may be regarded as peculiar vibratory motions of ponderable matter, having quantitative relations to all other forms of motion.

"It must, however, be remembered," Dr. J. remarks, "that these three stages pass insensibly into one another; and that, in the history of these ideas in individual minds, some ideas regarding the separability of matter and force may be found in the third stage, while other ideas may still halt at the second, or never get beyond even the first stage which I have described. Thus every one may admit the inseparability of matter from the forces that cause gravitation and chemical action; whilst some may hardly be prepared even now to allow that heat is equally inseparable from matter. Still less readily may the cause of light be admitted to be inherent in ponderable matter; and few at present are able to believe that electricity and magnetism are peculiar motions, excited only in the molecules of ponderable matter. In other words, the third stage of ideas regarding the union of matter and force may to some extent be received by every one; but, in its full extent, it is only gradually becoming recognized as undoubted truth. As soon as it is admitted that force is absolutely inseparable from matter, whether gas, liquid, or solid, it will become as impossible to think that matter can consist only of centres of force, as to think that matter can be inert or void of all force. Matter must always be in a state of motion, or of tendency to, or of resistance to, motion; it can never be in a state of perfect rest."

Immediately connected with the idea of the inseparability of matter and

force, is another modern idea regarding force which is intended to be expressed first by the term conversion of force, and subsequently in succession by the terms correlation of forces, conservation of force, and lastly, by conservation of energy. This last term has been adopted in order to avoid the indistinctness and confusion which come from using the word force at one time as the cause of an effect, and at another time as the effect itself; and in order to confine ideas to the effect, which alone can be the object of experimental research. "Thus," observes Dr. J., "the word force, of the nature of which we know only that it is indestructible and inseparable from matter, is the cause of energy, and energy is the effect of force."

The following diagram may perhaps render the use of these terms more clear.



The idea of the conservation of energy is, that the sum of the actual and potential energy in the world is constant. The force, or, as it is better called, the actual energy, that can be put into the cannon ball, is exactly equal to the latent or potential energy in the gunpowder, and this depends on the chemical force in the oxygen, hydrogen, and carbon. The ball gains only what the powder loses. As the potential energy, or tension, decreases, the actual energy, or motion, increases, and no loss or gain in the total amount of motion and tension can occur. Whatever the form of motion may be, it can only come either from some other form of motion or from some form of tension.

"It has been Dr. Joule's great work to exhibit experimentally the measurable relation between heat and gravity. He has determined that a certain amount of one kind of motion does produce an equivalent quantity of another kind. He proved that 772 pounds weight of matter falling one foot gives rise to enough heat to raise a pound of water one deg. Fahr. in temperature. He called the unit of mechanical motion one pound weight falling one foot = one foot-pound, and the unit of heat that quantity which raises one pound of water one degree Fahr.; then the mechanical equivalent of heat is 772 foot-pounds.

"The equivalence of other forms of energy has yet to be determined by experiment. Meanwhile, according to modern ideas, the different forms are so related to one another, that none can be lost, and none can be produced except by passing into or out of some other form of energy."

Dr. J. sums up the present state of our knowledge in the abiological sciences regarding matter and force in the following formula: "Where matter is, there force must be, showing itself in motion, tension, or in resistance. Without matter, no kind of motion, nor tension, nor resistance occurs."

In his second lecture Dr. Jones considers the matters and forces in those sciences—the biological—in which the idea of life is concerned, and he shows that our ideas regarding the union of living matter and living force, have passed, or are passing through the same three stages that they have done in the physical sciences. Dr. J. shows by quotations from our oldest records that "in the earliest ideas of all nations and probably of all individuals, no doubt whatever exists as to the entire separability of the ideas of matter and of vital force; and the first stage of ideas in the biological sciences is identically the same as the first stage in those sciences into which the idea of life does not enter.

"As the second stage of ideas," he continues, "in the abiological sciences consisted in the assumption of an imponderable matter, which was considered to be separable from the ponderable matter, and diffusible through it, giving rise to the phenomena of force in every part; so the second stage, or partial separation in the ideas of living force and matter, is marked by the assumption of a living imponderable gas or fluid pervading the ponderable matter. This stage, from the renown of him who gave it the greatest support, may well be called the Hunterian stage."

The idea of a subtile æthereal fluid diffused through the frame, enabling it to show all the phenomena of life, was taught by Hoffman, whilst others assumed

that, instead of a single vital fluid capable of doing all work, there were many different vital fluids, each capable of doing its own work and no other. The most remarkable of these was the nervous fluid.

"Another very remarkable vital fluid was considered to be a chemical agent, an elementary principle, or highly attenuated substance, which, among its other singular and remarkable properties, has that of imparting to the constituent matters of the animal frame new chemical affinities between it and the surrounding elements, and thereby protecting the living fibre from dissolution, or giving them other properties which, without this vitalization, they would not possess."

"The progress of animal chemistry," Dr. J. very justly observes, "proves more and more clearly that the matter in the body has no special chemical properties peculiar to life; but that matter within possesses the same chemical energy which it possesses out of the body. Life has no power to create or destroy any chemical force in the matter of living things; but the very slightest difference in the circumstances under which any chemical action occurs, produces a variation in the effects that are produced. Ultimately, when all the circumstances under which vital chemical actions occur are fully made out, there will be found to be no difference between these actions and those which can be made to take place where no influence of life can be supposed to exist."

"Another vital fluid, or principle, has been assumed to account for the phenomena displayed at the beginning of life in animal and vegetable bodies. Dr. Prichard says: 'This vital principle assumes the character of a plastic or formative power. It presides over, and sets in action, the different processes by which growth and organization are effected, and gives form and modification to the exponent parts of the animal and vegetable body, and contributes afterwards by a preserving influence to the maintenance of its existence for a definite portion of time. This doctrine ascribes to a thing which is supposed to be merely a species of matter highly attenuated, properties and agencies which belong to the highest power and the highest intelligence.' It appears, then, that, in the biological as in the abiological sciences, ideas of the union of matter and force have gone, or are going, through two identical phases. As in the abiological sciences the earliest ideas of matter were quite separate from the ideas of force, so vital force, in the first stage of our ideas, was originally pure spirit, void of all materiality, perfectly separable from matter."

In his third lecture, Dr. Jones shows that the third stage of ideas regarding the union of matter and force is growing up, and that it gives promise of fruit far beyond any we have hitherto gathered in physiology, pathology, and therapeutics.

"The general ideas regarding the union of matter and force in the biological sciences, have not as yet," Dr. J. observes, "got beyond the second or Hunterian stage; and there are many who think that the first stage, which consists in the complete separability between matter and living force, still represents the whole truth. The third stage, or complete union between the ideas of matter and living force—that is, the utter inseparability of one particle of living force from the matter in which it has been placed, is as yet in its infancy, and cannot be yet subjected to the examination it will have to undergo."

"We are only just entering upon the inquiry how far our ideas of conservation and correlation of energy can be extended to the biological sciences. We are only just beginning to ask how far a balance can be struck between the income and outgoing of all the energy which vegetables and animals possess in health and in disease. The quantity and quality of the energy that comes in, and the quantity and quality of the energy that goes out of the living thing, are questions in every respect as inseparable from the progress of biology, as the quantity and quality of the matter that enters into or is thrown out of any system. The slight progress that has hitherto been made is seen in the fact that there are many persons at present able to rest in the belief that the inseparability and conservation of matter and force are our main principles and our best guides in the abiological sciences; whilst most persons think that in the biological sciences the perfect or imperfect inseparability of matter and force, and the constant creation and annihilation of energy, are most likely to be the true foundations on which the sciences that include life must be built. But, if this be

so, then the creation and annihilation of force must be established by positive proof, and must not rest only on assumptions which are directly opposed to the most certain knowledge we possess regarding matter and force in other branches of science.

"We know now that in all living things no separate or peculiar matter is present. The stuff which takes part in the living actions, and the forces which are inherent in that stuff are there, and indestructible and inseparable. Inorganic matter and inorganic force always exist together in living things; so that, if a separable living force be also present, then we must admit that two totally different laws of force must be in action at the same time in the same matter. The unity of nature will at least be preserved by our hesitation to admit the assumption of a force capable of creation and annihilation, until some very conclusive evidence be obtained that there actually is in living things such a force or forces capable of being separated entirely from the matter of which they are made. Until this be proved, let us inquire how far the third stage of ideas regarding the union of matter and force and the principle of the conservation of energy opens new paths for investigation, and gives us new glimpses of truth. What are the actual and potential energies which enter into the body? To what motions do these energies give rise there? How do these motions leave the body? Matters in a state of tension, and ready for chemical motion, are constantly going into the body in the food and air. The quantity of active and latent energy which goes in, ought exactly to balance the quantity which comes out, deducting that which remains latent in the chemical substances, or becomes active in the actual warmth of the body itself. The chemical changes in the matter within the body (that is, the decrease of potential energy or tension) give rise to different forms of motion. These motions appear as the functions or work of the body. Two chief kinds may be distinguished—first, motion in great mass, as mechanical work, etc.; secondly, little mass, or molecular motion, as heat, electricity, nutrition, etc. A little mass of carbon and of oxygen contains a certain amount of tendency to move, that is, of potential energy. These molecules, as soon as they can, move together, and the motion produced must continue in some form until a state of tension or potential energy again results. The latent force of the nourishment is most easily measured by determining the amount of latent heat which the food contains. In order to do this, a known amount of substance is burnt, and the amount of heat produced is determined; and as the mechanical equivalent of heat is known, the equivalent amount of work which the substance can do may be calculated. By far the greater part of the potential energy or tension which goes in is ultimately changed into warmth. Other modes of motion, as electricity and mechanical work, take but a small part of the total income. The balance-sheet at present can give an idea of the form which the account will ultimately take; but it cannot tell the items with any approach to accuracy. The difficulties which surround the determination of these items at present may be seen by looking for a few moments where our knowledge now is regarding the origin of muscular motion.

"According to the earliest ideas, muscular motion was produced by the soul. According to transition ideas, the motion was considered to be created by a definite something, a vital force or fluid, capable of being increased or diminished according as stimulants (nervous or other) acted on it or not; and finally, capable of quitting the matter of the muscle a short time after the body was dead. The Hallerian irritability was the best representative of this stage of ideas. According to the latest ideas, the origin of the motion must be some antecedent equivalent motion. This is looked for in the chemical changes in the nitrogenous or the non-nitrogenous matter of the contractile texture or surrounding blood. 'No one,' says Dr. Frankland, 'possessing any knowledge of physical science, would now venture to hold that vital force is the source of muscular power. An animal, however high its organization, can no more generate an amount of force capable of moving a grain of sand than a stone can fall upwards, or a locomotive drive a train without fuel.' Professor Liebig and Playfair, and others say, that the chemical changes in the nitrogenous matter of the muscles are the cause of motion. Professors Frankland, Fick, and others

say that the mechanical work is much greater than can be accounted for by the amount of change in this matter, as measured by the urea produced. They determine the amount of mechanical work done in a given time, and they translate it into its equivalent of heat, weighing also the urea produced in that time. By burning a known weight of muscle out of the body, they determine how much heat it can produce; and from this they can calculate how much muscle must be burnt in the body to give an amount of heat equivalent to the mechanical work done in the given time. They then calculate what amount of urea this weight of muscle would produce. By comparing the actual amount of urea produced with the calculated amount, it appears that only one-fifth of the work can come from chemical change in the nitrogenous texture of the muscles. Four-fifths of the work must arise from the chemical action going on in the non-nitrogenous matters in the muscles or in the surrounding blood.

"The experiments made by Dr. Parkes most completely confirm the view that the motion of the muscle during exercise does not bear any relationship to the amount of chemical disintegration in the albuminous substance of the muscle. Indeed, he suggests the opinion that the action of the muscle is not connected with disintegration, but with formation; that, when it is in exercise, it increases; and, when it is quiescent, it lessens in bulk; that is, that it more rapidly disintegrates during rest than during exercise. This view can only be proved by a vast amount of further experimental research.

"When this question, which regards the value of this one item in the expenditure and income of matter and force, is solved by experiment, there will be left still more difficult problems—as, for example, how this conversion of heat into contraction of muscular fibre takes place; how the nerves are made to be able to increase or lessen the conversion of latent into active energy at will. This most extensive and important inquiry, which the doctrine of the conservation of energy has opened to our work, is good evidence that the third stage of ideas on the union of matter and force is beginning to be received in physiology.

"What the worth of these ideas is may be seen in the comparatively simple problem of the source of animal heat, when the doctrine of the conservation of energy is admitted. Whether animal heat arises from nervous force or from chemical action has been a point as disputed as whether voltaic electricity arose from metallic contact or from chemical action. The dispute is ended in both instances by the admission of the doctrine of the conservation of energy. If the animal heat comes from nervous force, or the electricity from metallic contact, then what is the equivalent of potential energy that gives these their actual energy? Unless the creation of force be assumed, the equivalent in actual or potential energy must be forthcoming. In the case of animal heat, it may be said that the nervous force comes from an equivalent energy of nutrition; but then the further question must be answered: Whence does this energy of nutrition come? And this brings us ultimately to the chemical force which gives the potential energy to the matter that enters the body. This is the prime origin of the motion which we call animal heat.

"The different kinds of apparatus or organs which the animal possesses for the conversion of energy determine in what form of motion the expenditure of energy can take place. The brain, the nerves, the muscles, the electric organs, the textures in general, all these are machines set in action chiefly by the potential energy or tension in the food, textures, and air; the supply of oxygen, hydrogen, and carbon being the first necessary condition.

"The mechanical, chemical, nutritive, muscular, and nervous motions are so related, that it is most difficult to separate the action of any one motion, even the simplest which can occur in the human body. When these motions are so increased or diminished as to constitute disease, then the difficulty of isolating any one motion becomes by no means lessened. Still, even in disease, the doctrine of the conservation of energy can enable us to make at least as great an advance as was made in our ideas and language when the doctrine of phlogiston, or the hypothetical inflammable principle which was thought to possess a power of levity, was given up.

"Vital force in disease must cease to be regarded as an imponderable material capable of varying in quantity and quality. It cannot be made more active

by stimulants, or be kept up by whips, whether ponderable as alcohol, æther, ammonia; or imponderable as heat, light, electricity, friction; nor is it capable of being made less active, or let down or untuned by excessive use or by withdrawal of the stimulants.

"When any excess of motion takes place, we must have an answer where the equivalent of that motion comes from, and whither it will go. Our ponderable and imponderable whips and stimulants are bound up with the matter, and produce more active motion according to the latent energy which the matter itself possesses. When any want of motion occurs, we must ask whence the deficiency of motion comes. Is there a want of matter possessing latent energy? or is there increased resistance to the conversion of latent energy into active motion?

"It may be said that this is only a verbal alteration; but it is, in truth, an alteration in the foundation on which our knowledge is based. It is an alteration which represents the direction in which science is advancing; and it is an alteration which not only marks the advance, but renders further progress more certain and more easy."

Dr. J. illustrates the importance of the change in our views regarding the union and conservation of matter and force by the phenomena of inflammation, and observes: "The principle of the conservation of energy requires that increased oxidation and nutrition in the inflamed part cannot arise except from an equivalent quantity of some form of motion, or some form of potential energy reaching the part. The same principle also requires that the inflammation must continue until the increased motion passes off in heat, or in pus, or in some other form of motion. Thereby the increased motions subside to the amount which is called health.

"The doctrine of the conservation of energy and the inseparability of matter and force will lead to an entire change not only in physiology and pathology, but also in that most practical part of medicine, therapeutics. At present, our knowledge is very confused and uncertain as to how and where medicines act. We almost believe that our medicines have the power not only of creating, but of annihilating force; and we almost think that they are able to select the part on which they will act, whilst they leave other parts of the body entirely free from their presence. From our want of knowledge how and where the effects are produced, the greatest possible difference of opinion exists as to the action and work of all the different classes of medicines—stimulants, sedatives, tonics, alteratives, specifics, evacuants. We are almost led to say that stimulants create force, because they increase contractility and sensibility; that sedatives destroy force, because they diminish contractility and sensibility; that tonics create force, and specifics destroy force, and alteratives change force. But the law of conservation of energy requires us to believe that no food and no medicine can cause the creation or the destruction of the slightest particle of energy. The amount of conversion of potential into actual energy may be made more or less. The conversion of one kind of motion into another kind may be diminished or increased, but no annihilation nor creation of force is possible.

"We must cease to regard the so-called imponderable heat, or its opposite cold, friction, or its opposite rest, electricity, light, etc., as entities that can be increased or diminished as remedies; and we must begin to look at them as modes of motion of the particles of matter in the different parts where they act. These modes of motion, by their correlations with the motions of oxidation and nutrition which are going on in the affected part, determine whether more motion or less motion should result.

"The medicines which are taken into the body have the same incapability as food to create or annihilate force; but they possess chemical energies by which, wherever they go, they take part in the motions of oxidation and nutrition which are going on there; and, according to their chemical properties, they add to the motions, or increase the resistance to the motions that constitute disease.

"The questions, then, which must be answered before we can obtain clear ideas of the actions of medicine in the body are: 1. What are the different motions which occur in the body? and how are these different motions related

to one another? and 2. How do different agents or medicines increase or diminish these different motions which occur in the different organs and textures?

"Assuming that any energy which shows itself in any of the motions of the body must arise from some other form of energy, and that this must ultimately be traced up to the chemical energy which enters with the food and air, then the action of medicines in increasing or diminishing or altering the action of oxygen in the different textures must be at least one of the most important questions in therapeutics."

Dr. J. illustrates these views by the action of acids and alkalies, which he shows are capable of taking a part in oxidation, and refers to his own experiments and those of Dr. Dupré, showing the rapidity with which certain medicines pass into every texture of the body (see No. of this Journal for July, 1865, p. 202), and maintains that they carry with them whatever force they possess, and thence infers that our present ideas of the local action of medicines are far too restricted.

"From these glimpses," he says, "into the physiology, pathology, and therapeutics of the future, each of which might well have been the subject of many lectures, it is evident that a great change will take place in our ideas in the biological sciences when we follow the progress of knowledge in the abiological sciences. As the abiological sciences have passed, or are passing, through three different stages of perfect and imperfect separation and perfect union of ideas regarding matter and force; so it is reasonable to expect that ultimately we shall pass through the same three stages of ideas regarding the union of matter and force in the biological sciences; and, if so, we shall arrive at an idea of life which will be based on the perfect union of matter and force.

"If biology be disposed to profit by the progress of the other sciences, we must endeavour to search for vital force, as the most peculiar of all the motions of which matter is capable. It must be able to arise from other motions and be able to give rise to other motions; and it must be altogether as incapable of destruction and creation as the abiological forces themselves. It may well be said, what can be the nature of this motion? how can it be understood? The answer must be the same as that which we must give even now regarding the nature of the motion of the simple or compound atoms of matter which we call electricity or magnetism, or even light or heat. How many among us at present have a clear idea of the motion of the simple molecules of matter which we call heat, or even gravitation and crystallization? Whilst we are unable to grasp the marvellously complex double polar motion of compound molecules which constitutes electricity, can we expect to be able to form an idea of the most complex of all the motions of matter from which the mind turns away to the image of some ærial or æthereal spirit, with large wings and larger powers; or rests satisfied with an imponderable gaseous or liquid matter diffused through living liquids, or temporarily attached to more solid granular matter?

"Notwithstanding our ignorance, let us attempt to gain knowledge by following in the footsteps of the abiological sciences. Whatever form of motion or tension proceeds from the body, let us regard it not as created or destroyed, but as the representative and equivalent of that energy which went into the body. Let us consider that the balance of in-going and out-coming energy of the body is exactly comparable with the balance of the in-going and out-coming matter; and let us remember that these balances are inseparably dependent the one on the other."

2. Dr. S. HAUGHTON, in his eloquent address, presents some highly important views on the subject of the *relation of food to work done by the body*. "It is admitted," he observes, "that man and other animals possess a double life, *animal* and *organic*, presided over respectively by two distinct, though correlated, centres of nervous force; of these, one *thinks, moves, and feels*; the other merely *cooks*, receiving the food supplied, changing and elaborating it into elements suitable for the use of the animal life." And he further observes, that "it is a simple matter of fact, and of every-day observation, that all these forms of

animal work, are the result of the reception and assimilation of a few cubic feet of oxygen, a few ounces of water, of starch, of fat, and of flesh.

"During childhood and youth, the food that we eat is used for the double purpose of building up the tissues of the bones, the muscles, the brain, and other organs of the body; and of supplying the force necessary for work done, whether mechanical or intellectual. In adult life, the first use of food almost disappears, for the bones, the muscles, the brain, and other organs, have already reached their full development, and act simply as the media of communication between the food received and the work developed by it.

"Let us take, as illustrations, the muscles and brain, regarded as the organs by means of which mechanical and intellectual work is done. These organs resemble the piston, the beam, and the fly-wheel of the steam-engine, and, like them, only transmit or store up the force communicated by the steam in one case, and by the products of the food conveyed by the blood in the other case. The mechanical work done by the steam-engine must be measured by the loss of heat experienced by the steam in passing from the boiler, through the cylinder, to the condenser; and not by the loss of substance undergone by the several parts of the machinery on which it acts. In like manner, the mechanical or intellectual work done by the food we eat is to be measured, not by the change of substance of the muscles or brain employed as the agents of that work, but simply by the changes in the blood that supplies these organs—that is to say, undergone by the food used, in its passage through the various tissues of the body, before it is finally discharged in the form of water, carbonic acid, or urea. * * *

"The food consumed in twenty-four hours, including air and water, undergoes a series of changes of a chemical character before leaving the body, in the form of one or other of its excretions. Some of these changes develop force, and others expend force, but the algebraic sum of all the gains and losses of force represents the quantity available for work. This work must be expended as follows: 1. The work of growth (*secular*). 2. The work of maintaining heat (*periodic*). 3. Mechanical work (*periodic*). 4. Vital work (*periodic*).

"During childhood and youth the work of growth is positive, for a certain proportion of the food used is employed in building up the tissues of the body instead of being expended in actual work; it is, in fact, 'stored up' in the body, as *vis viva* is stored up in the fly-wheel of machinery, and constitutes a reservoir of force that may be called upon at an emergency requiring sudden expenditure of force, or in case of illness, or in the gradual wasting of old age.

"In adult life, and in old age, the work of growth ceases completely, except so far as it is necessary to repair, from day to day, the small wastes of the organs employed in work; so that nearly the whole of the food employed is expended on the *periodic* work of the body.

"Hence we can readily see the reason for the aphorism, which asserts that food is more necessary for the young man than for the old, and more required by those of a lively disposition, either of mind or body, than by others."

It was demonstrated by Lavoisier that the source of animal heat is to be found in the combustion of the carbon of the body by the oxygen of the air received into the lungs by respiration.

"As soon as it was satisfactorily established by Lavoisier and his successors that the natural combustion of carbon and hydrogen in the blood was sufficient, and rather more than sufficient, to account for the animal heat, it became a matter of great interest to physiologists to ascertain, if possible, how much of the work developed in the blood by chemical changes is employed in producing animal heat, how much in mechanical work, external and internal, and how much in vital or mental operations."

From numerous observations, some of which were made by Dr. Haughton on the daily labour of hodmen, paviors, navvies, and peddlers, he has obtained the following mean:—

"Daily labour of man=353.75 ft. tons.=109549 kilometres.

"This quantity of work is the exact equivalent of the work done by a man of 150 lbs. weight in climbing through one mile of vertical height, and is, as I have already shown, less than one-eighth part of the work expended in producing and maintaining animal heat.

"Even if we add to the external muscular work that of circulation and respiration, which may be estimated at 133 foot-tons, the whole work done by the muscles, voluntary and involuntary, of a hard-worked labourer will amount to less than one-sixth of the work expended in maintaining the temperature of his body at 100° Fahr.

"I was led to believe, from my investigation as to the quantity of urea excreted in various diseases, that a certain minimum quantity equivalent to 2 grs. per pound avoirdupois of body weight, was excreted quite independently of muscular exertion, and I proved that death was preceded in many chronic diseases by a fall in the urea excreted to 2 grs. per pound. These investigations were made chiefly on patients dying of advanced kidney disease, in which the excretion of albumen had nearly or altogether ceased, and on patients dying of phthisis."

"If these views," says Dr. H., "be well founded, it is plain that part only of the urea excreted can be regarded as due to muscular exertion, for 2 grs. per lb. (or 300 grs. for a man weighing 150 lbs.) must be set aside as a constant due to vital work, independent of muscular work altogether. Hence it would follow, supposing the muscular exertion to be measured by the increased excretion of the urea produced by it, that the urea will not increase as fast as the muscular exertion, but it ought to increase regularly, although at a slower rate."

To settle this important question, Dr. H. ascertained by repeated experiments, that the amount of his own excretion of urea (under ordinary conditions of exercise, which did not exceed five miles per day) ranged from 465.09 grs. per day to 537.47 grs., the mean being 501.28 grs. He then compared this with the average found from several days of unusual muscular exertion. The average work done each day, for five consecutive days, was 20.74 miles of horizontal walking, "the result of which upon the urea excreted was to be compared with the result already mentioned, as a physiological constant determined under circumstances in which the daily muscular work never exceeded five miles of horizontal walking."

In order to determine the urea, he collected all the urine passed, and kept one-fifth part of it; and at the close of the fifth day examined the mixture formed from the five days' urine. It was found to contain 501.16 grs. of urea per day—a result identical with the physiological quantity previously found by him under totally different conditions, viz., 501.28 grains.

"It might be objected," Dr. A. remarks, "to the preceding reasoning that there can be no doubt as to the capability of the combustion of proteinic compounds represented by 501.28 grs. of urea excreted to produce mechanical force sufficient to explain the muscular exertion of walking 20 or 21 miles per day, as may be shown in the following manner:—

"1. The urea excreted bears to the proteine consumed the proportion of 24 to 79, as appears from their chemical compositions, viz.—

Urea	$C_2H_4N_2O_2$		60
Proteine	$C_{36}H_{27}N_4O_{12}$		395

"2. In 100 parts of proteine there are 53.7 parts carbon, and 7 parts of hydrogen; the total heat due to the combustion of 1 grm. of proteine is, therefore,

	Heat-units.
0.537 gramme of carbon	4.3389
0.070 gramme of hydrogen	2.4123
	6.7512

"This number, 6.7512, represents the maximum quantity of heat units¹ that could be produced by the combustion of 1 grm. of proteine; but the term depending on hydrogen in it should be reduced to $\frac{5}{8}$ ths of its amount in consequence of the hydrogen already combined with oxygen in the proteine. Hence we find—

¹ Heat unit = 1 kilog. of water raised 1° C.

Combustion of 1 gramme of Proteine.

	Heat-units.
Carbon	4.3389
Hydrogen	1.3402
	5.6791

"3. In 100 parts of urea there are 20 parts of carbon, and $6\frac{2}{3}$ parts of hydrogen; the total heat, therefore, due to the combustion of 1 grm. of urea is—

0.20 grm. carbon	1.6160
0.067 grm. hydrogen	2.3089
	3.9249

"The term depending on hydrogen in this result, should be reduced to $\frac{1}{2}$, in consequence of the hydrogen already combined with oxygen in the urea.

Hence we find—

Combustion of 1 gramme of Urea.

Carbon	1.6160
Hydrogen	1.1544
	2.7704

"4. From the three preceding statements it is easy to see that, for every gramme of proteine consumed, 0.8416 heat-units are contained in the urea excreted; so that the digestion of 1 grm. of proteine gives out 4.8375 heat-units.

"It is easy to see that 501.23 grs. of urea excreted correspond to 1650 grs. of proteine in the food, or to 106.92 grms.; and the total work due to the digestion of this quantity of food may be found by multiplying it by the 'digestion coefficient' already found, and by 423, which is Joule's coefficient for converting heat-units into kilogrammeters. Hence we have—Work due to production of 501.28 grs. of urea= $106.92 \times 4.8375 \times 423 = 218786$ k. m.=704 ft. tons.

"This amount of theoretical work produced by nitrogenous food is more than double the work actually done during the walking excursion.

"The average work was 20.74 miles horizontal per day, which may be considered as the exact equivalent of lifting my weight (knapsack and clothes included=150 lbs.) through one mile of vertical height. Hence the work actually done by me was

$$\frac{150 \times 5280}{2240} = 354 \text{ foot-tons.}$$

"I have elsewhere shown that the work done by the heart per day amounts to 122 foot-tons, which should be added to the external work, as well as the unknown work due to the muscles used in respiration, probably amounting to one-sixth of the heart's work, or 21 foot-tons; adding these quantities, we find—

External work	354 foot-tons.
Circulation and respiration	133 "
	487 foot-tons.

"This quantity represents 69 per cent. of the applied work, which was shown to be 704 foot-tons.

"The amount of muscular work accounted for is 354 foot-tons, which is almost exactly half the whole theoretical work supplied by the food that goes to form urea, viz., 704 ft. tons; but it has been already shown that 2 grs. of urea per pound of body weight is required to maintain the vital work, including circulation and respiration; this would give from 240 grs. to 260 grs. of urea out of the 501 grs. available for vital work, so that one-half of the available work may be considered as expended on vital work, and the other half as expended on external muscular work. This supposition, however, requires us to believe that the muscles act without loss by friction. This is not admissible, for I have elsewhere endeavoured to show that there is a loss in the force applied by the

muscles of various animals in consequence of the friction of their tendons, amounting—

In man to	35 per cent.
In the mastiff to	41 “
In the kangaroo to	61 “

“Hence it may be regarded as certain that the available force represented by 501 grs. of urea is not sufficient to account fully both for vital work and for the external mechanical work expended by me during the experiments just described.”

Liebig and his followers assigned to nitrogenous food the duty of providing the force necessary for the production of muscular work, by supplying the waste of muscular tissue, which waste was supposed to be represented by the urea of the kidney secretion; while they supposed the farinaceous and fatty foods to provide the amount of animal heat required by the body; while their opponents deny that nitrogenous food contributes any portion of the force employed in muscular work. “The truth,” Dr. H. says, “as is usual, lies between the two extreme hypotheses, and we are now compelled to admit that a given development of force, expressed in animal heat, muscular work, and mental exertion, may be the effect of several, perhaps many, supposable supplies of digested food, farinaceous, saccharine, fatty, and albuminous.”

Lavoisier supposed, in his earlier investigations, that animal heat was developed by the combustion of carbon and hydrogen in the lungs, while Liebig and his followers supposed the muscular waste to be developed in the substance itself of the muscles which were its instruments. Both these doctrines are now repudiated by physiologists, and the view proposed by Mayer, of Heilbronn, has been accepted, that the blood itself is the seat of all the chemical changes that develop force in the body. “No two classes of animals,” observes Dr. H., “can well differ more from each other than the cats and ruminants, one of which is intended by nature to eat the other. They differ in all respects as to food, the cats requiring a supply of fresh meat and blood for their health, and the ruminants being exclusively vegetable feeders; yet in both classes we find a great development of muscular power and of rapid action of the muscles, qualities alike necessary to the pursuer and to the pursued. There can be no doubt that muscular work is developed in the cats from the combustion of flesh, and in the ruminants mainly, if not exclusively, from farinaceous food. It is, however, worthy of remark that the muscular qualities developed by the two kinds of food differ considerably from each other. The hunted deer will outrun the leopard in a fair and open chase, because the work supplied to his muscles by the vegetable food is capable of being given out continuously for a long period of time; but in a sudden rush at a near distance the leopard will infallibly overtake the deer, because its flesh food stores up in the blood a reserve of force capable of being given out instantaneously in the form of exceedingly rapid muscular action. In conformity with this principle, we find among ourselves an instinctive preference given to farinaceous and fatty foods, or to nitrogenous foods, according as our occupations require a steady, long-continued, slow labour, or the exercise of sudden bursts of muscular labour continued for short periods.”

A number of examples are given by Dr. H. in illustration of this principle, which we have not space here to insert.

In conclusion Dr. H. shows the application of theory to diseased conditions of body, and takes as examples, 1, typhus fever; 2, cholera Asiatica; 3, diabetes mellitus.

1. In *typhus fever*, he observes, “a prominent symptom is the remarkable elevation of temperature, accompanied by an increased excretion of urea and carbonic acid by the kidneys and lungs, indicating (as no food is taken) an increased morbid metamorphosis of the blood and tissues. The temperature frequently rises to 104° Fahr., representing an increase of upwards of 5° Fahr. above the normal temperature.

“If we knew the cause of this increase of temperature, or rather of the increased metamorphosis of which it is the sign, we should know the cause of

typhus fever, and learn to combat the disease on rational grounds. At present the cause is unknown, and therefore the physician is forced to treat the symptoms as they appear, instead of attacking the cause of the disease. Let us examine for a moment the terrible significance of the symptoms.

"Your patient lies for nine or ten days, supine, fasting, sub-delirious, the picture of weakness and helplessness; and yet this unhappy sufferer actually performs, day by day, an amount of work that might well be envied by the strongest labourer in our land.

"The natural temperature of the interior of the body is 100° F., while the temperature of the corresponding parts in typhus fever is at least 105° F. This seems at first sight a small increase—only five per cent. of the whole; but it is in reality $2\frac{1}{2}$ times as great as it appears, and actually amounts to $12\frac{1}{2}$ per cent., or *one-eighth* part of the total animal heat. For the total quantity of heat given out by the heated body is proportional (from Newton's law of cooling) to the elevation of its temperature of equilibrium, towards which it tends. If we suppose this equilibrium temperature to be 60° F., then the quantities of animal heat given out in typhus fever and in health will be in the proportion of 45 to 40, showing that the animal heat of typhus exceeds that of health by *one-eighth* of its amount.

"We have already seen that the work due to animal heat would lift the body through a vertical height of eight miles per day; and it thus appears that an additional amount of work, equivalent to the body lifted through one mile per day, is spent in maintaining its temperature at fever heat.

"If you could place your fever patient at the bottom of a mine, twice the depth of the deepest mine in the Duchy of Cornwall, and compel the wretched sufferer to climb its ladders into open air, you would subject him to less torture, from muscular exertion, than that which he undergoes at the hand of Nature, as he lies before you, helpless, tossing, and delirious, on his fever couch.

"The treatment of this formidable disease in former times consisted of purging, vomiting, and bleeding the patient, with the view of eliminating an imaginary poison, and so helping nature to terminate the disease.

"In modern times, thank God, the physician either does not interfere at all, or adopts the rational process of retarding the disintegration of the tissues consumed to supply the fever heat, by furnishing in their stead fuel, in the form of wine and beef-tea, sufficient to maintain the increase of temperature imperiously required. This practice may be justly considered rational, because the condition of the circulation admits of its application, and it is considered good, because it has been rewarded with success in the hands of the skilful clinical physician. In concluding this sketch of the prominent symptom of typhus fever, and as an illustration of the eagerness with which every possible combustible in the body is made use of, I may mention, on the high authority of Dr. Stokes, of Dublin, that the very urea excreted by the kidneys is not permitted to leave the body without first paying its tax to fever, by being burned into carbonate of ammonia, thus rendering the urine of an advanced case of bad typhus fever eminently alkaline."

2. "*Asiatic Cholera* presents, as every one knows," Dr. H. remarks, "three distinct stages: 1. The premonitory stage of diarrhœa. 2. The stage of collapse. 3. The stage of consecutive fever.

"The stage of collapse exhibits the following symptoms: Vomiting or purging, muscular cramps, suppression of bile and urine, lowering of body temperature to 95° F., extreme prostration of strength, extremities pulseless, and face Hippocratic.

"When death occurs during collapse, the following symptoms are usually found on careful examination of the corpse: The temperature rises to 103° F., the muscles give out their characteristic susurrus CCC, and exhibit spontaneous movements, the whole train of symptoms producing the effect of a ghastly attempt at resurrection.¹

¹ "It is startling, on making a post-mortem examination of a cholera patient alone, and by candle-light, to witness, on the first free incision of the scalpel, the hand of the corpse rise slowly from its side, and place itself quietly across its breast."

"In this disease we have phenomena respecting animal heat, the very reverse of those found in typhus fever; the body performing one vertical mile short of its daily work, instead of one mile in excess. The prostration of strength resulting from this deficient combustion is so great, that death is often caused by bringing the patient to hospital in a cab instead of upon a stretcher, by his walking up a dozen steps into his ward; and sometimes even fatal results have followed a sudden effort to sit up in bed to vomit.

"The rise of temperature after death, and the continuance of muscular surrus and motion, tend to prove that the impeded circulation, which is the prominent symptom in cholera collapse, is due to constriction (probably vaso-motor nervous) of the capillaries, in consequence of which the muscles are deprived of their supply of freshly-oxidized blood, the result of which is necessarily contraction and cramp, which produces the excessive agony that characterizes this disease.

"All authorities on cholera, whether their object be to 'impede' or to 'assist' nature, are agreed that medicines, whether astringent or purgative, are not only useless, but dangerous, in the stage of collapse.

"It is useless to give alcoholic fuel to restore the loss of animal heat, for there is no circulation to cause the oxidation of the hydrocarbons. It is equally useless and more dangerous to give opium, to check the remaining purging that exists; for if vomiting have ceased, your acetate of lead and opium pills lie as if in the stomach of a corpse, and at the termination of collapse your patient enters upon the consecutive fever with perhaps a dozen grains of opium in his stomach, placed there like an explosive shell by your ill-timed zeal, and rapidly passes into a comatose condition, from which he never for a moment rallies. His death is always accredited by the registrar to cholera morbus, and not to opium.

"Purgatives and emetics¹ in cholera collapse effect the same object as opium, but with greater rapidity. In the stage of blue collapse the chances of life and death are almost exactly equal, and the slightest additional loss of force turns the wavering beam on the side of death. The effects of a brisk purgative or emetic (if they act) upon a patient unable to climb a dozen steps, or sit up for a quarter of an hour without fatal syncope, may be easily imagined; and the use of them cannot be justified by any arguments borrowed from right reason.

"A remarkable though transient improvement takes place in collapse by the injection of warm water (brought to the specific gravity of serum by the addition of mineral salts) into the veins or bowels; the patient loses the cramps, feels that he is about to recover, speaks to his friends, and often transacts whatever business is necessary, but speedily falls back into collapse. The improvement in his condition is altogether due to the temperature of the fluid injected, which supplies for a brief period the deficient animal heat, permits a partial oxidation of the blood, restores the capillary circulation in the muscles, and so destroys their cramp; and, by supplying the deficient work required, removes for the moment the fatal prostration of strength. Any one who has witnessed the remarkable effects of warm liquids thus injected in cholera collapse must feel that recovery would be certain if the improvement could by any possibility be made permanent.

"Our hopes for the future, as to the treatment of cholera, lie, as I believe, in the direction of supplying to the body directly its lost animal heat. I have witnessed the happiest results from an injection of warm salt water into the bowels, assisted by hand friction of the surface with turpentine and chloroform, and the application of bags of hot salt along the spine; in cases treated in this manner we may expect to witness cessation of muscular cramp, restoration of perspiration to the skin, with increase of capillary circulation, and finally, to reward our efforts, a return of the excretions of urine and bile; when these reappear, all vomiting and purging cease, and our patient is almost cured.

"After recovery, the contrast between the cholera and fever patient is as

¹ "When mustard is used, its conservative effects as a stimulant sometimes counteract its destructive effects as an emetic."

great as it was during sickness. The fever patient has been overworked for nine or fifteen days without a suitable supply of food, and, when convalescent, experiences a complete exhaustion of strength that lasts for many weeks. The cholera patient, on the other hand, has been prevented from working by constriction of the capillary vessels, caused by the absorption of the cholera poison,¹ and feels, on recovery, much like a man that has been half drowned, while the fever patient resembles a man that has been half starved; the one is able to return to his work in the course of a few days, the other, only after the lapse of so many weeks.

"There are two popular superstitions prevalent among medical men respecting nature, which yearly slaughter hecatombs of victims, viz., that nature is simple in her operations and beneficent in her intentions: she is often both simple and beneficent, but at other times she is unquestionably both complex and malevolent."

Before trusting Nature in cholera, and proceeding to help her, Dr. H. thinks it would be well "to inquire whether she intends to cure the patient by her evacuations, or to put him into his coffin. For myself, I greatly mistrust her, and would wish to ask, previous to assisting her, whether she is really my mother or only my stepmother. Our experience in Dublin has shown that no more effectual mode of shortening life could be devised in cholera than the 'eliminant' treatment; and it was accordingly abandoned as soon as tried in that city.

"It is much to be regretted that an authority so deservedly held in high repute as that of Sir Thomas Watson can be now quoted in favour of the treatment of cholera by the maxim *similia similibus curantur*. So far as Dr. Watson has informed us, his change of opinion rests upon the statements of others, and not upon his own experience. He has suddenly become an advocate of the castor-oil, rhubarb, calomel, and eliminant treatment of cholera, and writes as follows:—

"When I last spoke on this subject in these lectures, I stated that the few recoveries which I had witnessed had all taken place under large and repeated doses of calomel, but I could not venture to affirm that the calomel cured them. At present, I am much disposed to believe that, by its cleansing action, the calomel may have helped the recovery; and after all that I have since seen, heard, read, and thought upon the matter, I must confess that in the event of my having again to deal with the disorder, I should feel bound to adopt, in its generality, the evacuant theory and practice."

"Sir Thomas Watson omits to add that the cases here referred to were only six in number, of whom three died, and three recovered; which is exactly what might have been expected if he had not interfered at all."

3. *Diabetes mellitus*, according to Dr. H., "furnishes us with one of our best proofs that all the chemical changes, by means of which work is produced, take place in the blood and not in the tissues of the body; and, at the same time, an examination of its phenomena explains satisfactorily the regimen and diet which has been found, by experience, most suitable to the diabetic patient. I shall illustrate the disease by a case which was placed under my control, by Dr. Stokes, some years ago.

"A young man, aged twenty, named Murphy, suffered from fever (enteric?) in November, 1859, and, on recovering, became diabetic; he was admitted into the Meath Hospital in October, 1860, where he remained, under my observation, until his death on January 12, 1861.

"He was allowed for nine weeks to eat as much as he liked of certain kinds of food, which were varied, week by week, to suit his wants, my object being to obtain, if possible, the natural constants of the disease undisturbed by external interference; the only medicine used by Dr. Stokes's order being opium, to produce sleep, and a little creasote occasionally to promote digestion. As the details of this experiment have been fully published, I shall confine myself to the final results. His food and excretions were analyzed from week to week, so

¹ "Whatever this may be, its period of incubation is forty-nine hours; that of strychnia is twenty-two minutes."

as to determine the total quantities of sugar-forming and urea-producing food, as well as the sugar and urea actually excreted.

"During six of the nine weeks the sugar excreted was in excess of the sugar ingested, and the means of the daily excretion and ingestion of sugar were—

Sugar excreted		9773 grs.
Sugar ingested		9321 "
Diff.		452

"During two of the nine weeks of observation the urea excreted was in excess of the urea ingested, and the mean daily excretion and ingestion of urea were—

Urea excreted		1182 grs.
Urea ingested		1349 "

"The foregoing facts illustrate strikingly one of the prominent symptoms of diabetes—viz., the canine appetite—the quantity both of sugar-producing and urea-forming food consumed is more than double what is necessary to maintain a vigorous labourer in perfect health. An examination of the excretions explains the other prominent symptom of diabetes—viz., the complete prostration of strength in the patient, notwithstanding the great amount of food consumed.

"In a state of health, food produces three excretions only—viz., urea, carbonic acid, and water; in diabetes the farinaceous foods appear in the excretions as sugar, and not as carbonic acid and water; and the work necessary to maintain heat must be provided altogether at the expense of flesh food, which is the very form of food least fitted to maintain it.

"The diabetic patient resembles a racing steamboat on the Mississippi whose supply of coal is exhausted, and whose cargo furnishes nothing better than lean pork hams to throw into the furnace to maintain the race. It cannot be wondered at that our poor patient, under such disadvantageous conditions, fails to keep in the front.

"Let us compare together the minimum of work necessary to keep Owen Murphy alive with the work actually supplied to him by the food digested.

"1. I have already stated that Dr. Ranke found 660 grms. of carbonic acid in the extreme fasting condition, when he weighed 67 kilogrammes. Now, since

$$\begin{aligned} 660 \text{ grammes} &= 10185.35 \text{ grs.} \\ 67 \text{ kilogrammes} &= 147.71 \text{ lbs.} \end{aligned}$$

we find 69 grs. per lb. of body weight as the minimum excretion of carbonic acid consistent with continued life.

"This quantity of carbonic acid represents a work generated by its production that would lift its corresponding pound of body weight through a height of

$$69 \times \frac{6}{22} \times 8080 \times \frac{9}{5} \times \frac{772}{7000 \times 5280} = 5.716 \text{ miles.}$$

"Under ordinary conditions, the greater part of this carbonic acid and work is produced by the digestion of farinaceous food; but since, as we have seen, the farinaceous food is excreted as sugar in the diabetic patient, and therefore does no work at all, the whole of the foregoing work must be done by the digestion of other kinds of food.

"I have already shown that it follows from Lavoisier's experiments (confirmed in a remarkable manner by those of Regnault), that the work done by the combustion of carbon in the body is to the work done by the combustion of hydrogen in the proportion of 9068 to 3024—almost exactly 3 to 1; hence we have the work done by Owen Murphy as a minimum in health.

Due to carbon		5.716 miles.
Due to hydrogen		1.905 "

7.621 miles.

"This result is somewhat in excess of the truth, for the same reason that the

calculated digestion coefficient of proteine is in excess of that found by Frankland from experiment; for the combustion coefficients of carbon and hydrogen, in organic compounds, are slightly less than when free. If we are permitted to reduce 7.621 miles in the same proportion as in the digestion of proteine—viz., 48 to 43, we shall find—

Owen Murphy—minimum of work consists of body weight
lifted through 6.83 miles.

“Let us now compare this minimum with the work actually performed by him when suffering from diabetes, by the digestion of flesh food and production of urea.

“2. I have already shown that the work produced by the formation of 501.28 grs. of urea is 704 foot-tons by calculation from the composition of proteine and urea; this result should be reduced in the proportion of 48,375 to 43,155, in order to obtain the work given by Professor Frankland’s experiments. Making this reduction, we find that 500 grs. of urea correspond to 626.3 foot-tons of work, or 100 grs. urea to 125.26 foot-tons; or, in other words—

“Every four grains of urea excreted correspond to five tons lifted through one foot.

“Owen Murphy excreted, on an average, 1182 grs. of urea daily during nine weeks, which, by the foregoing rule, are equal to

$$1475 \text{ foot-tons} = \text{Murphy} \times x;$$

where x represents in miles the height through which the patient could be lifted by the work done per day: and is equal to

$$x = \frac{1475 \times 2240}{93.66 \times 5280} = 6.69 \text{ miles.}$$

“This result is almost exactly equal to that already found as the minimum consistent with continued life, and explains in the most satisfactory manner the complete prostration of the patient, notwithstanding the consumption and digestion of more than double the usual quantity of flesh food.

“In corroboration of the foregoing conclusion, I may mention that Murphy’s temperature was found to be constantly 2° Fahr. below that of other patients (chronic) placed in the same ward, and, in other respects, under similar conditions. His unfavourable symptoms (so long as his powers of digestion were not impaired) were invariably alleviated by the free use of flesh food and fat, the latter being instinctively preferred by him; so much so that during the delirium that preceded his death for twenty-four hours, he raved incessantly about ‘fat, roasted fat, which the angels of heaven were preparing for him.’

“I have studied many other cases of diabetes mellitus, and found similar results in all; but I feel it to be unnecessary to describe them, as one well-ascertained train of phenomena, carefully observed and recorded, is quite sufficient to establish the order of nature.”

While it may be perhaps, considered that Dr. H. has not fully accounted for all the phenomena of typhus fever, it must be admitted that he has most satisfactorily explained the prominent ones and corrected some prevalent erroneous notions. He has demonstrated that in patients lying in bed with typhus fever there is not, as has been supposed, a cessation of those processes which exhaust the bodily forces, but, on the contrary, that these processes are going on with unwonted activity—that the elevation of bodily temperature involves an expenditure of force greater than that consumed by a labourer in a hard day’s work—and that consequently there is a peremptory demand for supplies of combustible food to maintain the oxidation of the tissues and to supply the force which could not otherwise be obtained, except at the dangerous expense of the tissues.

His explanations of the phenomena of cholera Asiatica and diabetes mellitus are of the highest importance, and constitute the most important and beautiful application that has been made of modern physiology to pathology and therapeutics. The correctness of his teachings must be assented to by all who carefully study these subjects.

ART. XXI.—*Giornale Italiano delle Malattie Veneree e delle Malattie della Pelle*. Compilato e Diretto dal Dott. G. B. SORESINA, Ispettore Sanitario di Milano, etc. Colla Co-operazione del Sig. Dottori ALBERTETTI CAV. GIACOMO, AMBROSOLI CARLO, etc. etc. Milano: 1867, Volumi III., IV.; e 1868, Gennaio e Febbraio.

The Italian Journal of Venereal Diseases and of Diseases of the Skin. Compiled and Edited by Dr. G. B. SORESINA, Medical Inspector of Milan, etc. With the Co-operation of Doctors JAMES ALBERTETTI, CHARLES AMBROSOLI, etc. etc. Milan: 1867, Vols. III., IV.; and 1868, January and February.

It is creditable to the zeal and intelligence of our medical brethren in Italy that they are able to sustain, in addition to professional journals of the usual character, one on special subjects. We may express the opinion that the expectations and promises of Dr. Soresina and of his collaborators, twenty-one in number, have been borne out by the substantial additions to our knowledge of the literature and clinics of Syphilography and Dermatology in the contents of the two volumes for the last year and of the two numbers for the present one. The Journal wears, in addition to its intrinsic merits, a pleasant face in its fine paper, clear type, and numerous engravings in illustration of various matters in the text. It has a large store of clinical materials to draw from in the separate departments of the great hospital of Milan for venereal and cutaneous diseases. The annual report of those of the latter class for 1865, by Dr. Dubini, shows that there were no less than 1483 cases successfully treated in that year in the hospital, and 64 out-patients prescribed for. Of this number, 904 were cases of scabies, 134 of tinea (porrigo), and 355 of non-contagious diseases of the skin. The last mentioned were made up of 181 males and 174 females. In both sexes the prevalent varieties of dermatosis were eczema, impetigo, erythema, prurigo, psoriasis, and *lupus*. The women were most affected with eczema during the period of lactation, and that in every month of the year. Impetiginous and pruriginous cases were most numerous in July.

The January number for 1867 opens with a paper on dermatology, written aphoristically by Prof. Gamberini, in which he gives a succinct yet lucid description of the several diseases of the skin, anatomically and pathologically considered, and brief references to their causes and occasionally to their treatment. After speaking of syphilitic and scrofulous dermatoses, the author pictures the gouty, alkaline, and arsenical varieties. A learned and instructive lecture on *Tinea tonsurans*, by Prof. Michelacci, finds place in the May and July numbers for 1867 and the January one for 1868. It is accompanied by engravings of a subject covered with porrigo, and of the hair of the spores of the vegetable parasite *Tricophyton*, belonging to the cryptogamous class, which fill up the capillary follicles, and are the determining cause of the disease. The treatment, applicable also to sycosis and acne, will consist primarily of depilation and destruction of the parasite by appropriate topical applications. It may be well to remember when depilation is had recourse to, that the pain accompanying this process is entirely prevented by the previous use of the ether spray, as recommended by Dr. Horand. Prof. Scarenzio gives the history of a case of tinea or porrigo favosa diffused over the surface of the body, in a young man aged twenty-six years, whose childhood and youth had been passed in great destitution. Generous diet, bitters, and chalybeates brought up the general system to a healthy standard. Fomentations and cataplasms, shaving the head, bathing, and cleansing washes, followed by a solution of corrosive sublimate to the parts, completed the cure. Another report on the department of the hospital for cutaneous diseases is made by Dr. Schivardi, in which he takes occasion to speak in strong terms of censure of the almost entire want of adequate lodging and means of bathing for the patients in the hospital affected with porrigo and scabies. He treats in detail of the history of this last disease, and of the discovery, structure, and habits of the *Acarus scabiei*. The successive modes of treatment are also detailed; the greatest stress being laid on storax and Helmerich's ointment, which latter the author believes to be the best remedy

of all those hitherto used. He relates the successful results of the practice of different physicians in favour of storax; but he regards this article as more costly than the ointment just named, and its use is attended with the serious drawback of staining the linen and other material worn next the skin. The ointment of Helmerich, as originally prescribed by him, consists of flowers of sulphur three parts, subcarbonate of potash one part and a half, and fat and oil enough to make a soft ointment. In the Milan hospital, brown soap, in the proportion of eight parts, is added, with the effect of a great increase of antipruritic virtue. A warm bath of an hour's duration, and a good lathering and washing with brown soap, should precede the use of the ointment, which is then well rubbed on the affected skin by the patient, assisted by a ward attendant. The patient then resumes his shirt, and his hands and arms are covered with cotton or linen pieces, and he is put to bed until the next day, when he takes a cleansing bath with soap, so as to remove all the ointment from his skin. Dr. Schivardi restricts the time required for this mode of treatment of the itch into a still shorter period, saying, a few lines further on, "By this method, a patient coming in early in the morning goes out cured in the evening." Under previous modes of treatment the stay in the hospital was nineteen days. The clothes used by the patients with itch are put into a box and exposed to a temperature of 122° Fahr., which destroys the acarus and its eggs. In some hospitals the clothes are subjected to sulphur fumigations. Dr. Schivardi denounces in strong language the barbarous practice of subjecting those afflicted with *tinea tonsurans*, or "scalled head," to the pitch cap.

Prof. Lombroso, in a letter to Dr. Griesinger, contained in the January and February numbers of the Journal for the present year, furnishing an interesting statement of the etiology, symptoms, anatomical lesions, and treatment of *Mania Pellagrina*, and incidentally notices the causes and comparative statistics of pellagra itself. "That the pellagrous are all of them inhabitants of the country or poor is," Dr. Lombroso assures us, "certain; that pellagra is diffused in the direct proportion to the cultivation of maize (Indian-corn), is equally certain. Thus Cremona and Brescia contain one pellagrous subject in every 21 or 22 of the inhabitants, Pavia only one in 488, and Sondrio one in 4166; the fact being that in the two first-mentioned districts the food consists exclusively of maize, and in the other two places, in addition, rice in the first and rye in the second. So also Rovgo, in the decennial period 1847-56, could furnish only 12 subjects of pellagrine mania, and Belluno 22, because in the first rice and in the second rye and chestnuts were abundant, while Verona and Treviso, yielding largely maize, gave 109 and 209 pellagrine maniacs; and pellagra is now for the first time making headway in Comarca and Val d'Arno, following the cultivation and use of maize. The disease does not appear in Naples and Sicily, owing to the use, conjointly with maize, of vetches, beans, figs, and golden apples." The author refers in a note to the statistics of Bellardini, from which it appears that of 37,268 pellagrous persons but 4032 were workmen, and all of the remainder were country people; the proportion of the sexes was 21,140 males, and 16,488 females. Chemistry fails to furnish us with any explanation, since maize is richer in the phosphates and azotates than rice, which, looking to China and India, cannot be accused of causing pellagra in the immense populations of those two countries, whose chief and almost sole food consists of this grain. Dr. Lombroso hints at the probability of an explanation being found in the *sporisorium* or spore product of maize.

The author tells us that in every hundred of the pellagrous there are 10 of this number insane. Of 50 persons labouring under pellagra, 27 had the disease by hereditary predisposition; in the 23 others there was no sign of serious organic or cerebral lesion. Of the first class there were 6 whose parents suffered from pellagra, 7 whose brothers were thus affected, while the aunts of 2 and the grandfather of 1 were in the same category. Two had fathers, one a brother, and two had uncles who had all been victims of alcoholism. Insanity had shown itself in the parents of four, in the brothers of three, and in the uncles of two of the twenty-seven sufferers from hereditary pellagra. Of the entire number only ten were cured; and of the twenty-three who were exempt from hereditary taint, there were ten cures. Five cases of mania pellagrina were referable to a

predisposition induced by insufficient food, and to the exciting causes of a moral nature—fear and matrimonial disappointment. In two instances the exciting cause was lactation in one and the puerperal state in the other. The food of all of them had been almost entirely maize, with a little rice and milk.

Dr. Lombroso presents, as the results of his observations for a period of five years, a statement of the peculiarities in structure and functions of the subjects of pellagrous mania, which come under the heads of weight of the body, erythema, configuration of the cranium, digestion, urine, motility and sensibility, and the psychical faculties. The *weight* of the body in the pellagrous maniacs is of the lowest degree met with in chronic diseases, and especially in insanity. On an average, it is less by 25 pounds than the physiological rate. The absence of erythema in so many of the patients received into the hospital may be explained by the circumstance of the long interval of exemption from rural labour, and consequent protection from the sun, exposure to which, if not the direct, is the adjuvant cause of the erythema. Inquiries would show the previous existence in these persons of the cutaneous eruption. Dr. Lombroso directs attention to an affection of the skin which seems to him to be quite common, as it occurred in 30 of the 50 cases whose history he records. It is telangiectasia, or a subcutaneous extravasation of blood spread over the breast and abdomen like petechiæ. The *cranium* has no special conformation belonging to this variety of insanity. The anomaly of the growth of the beard in women and its absence in men, so common in the insane generally, is seldom seen in the pellagrous, except the disease be hereditary. The same may be said of malformation of the ears and teeth. The *digestive functions*, which in the first period of pellagra are so much deranged, are quite normal in pellagrous mania. The subjects of this latter no longer complain of that burning heat in the epigastrium and the continuous eructations which are so tormenting before the outbreak of mania. It must be said, however, that nearly all of them exhibit a tongue with longitudinal and sometimes transversal cracks and fissures, and with a dry and red surface from abrasion of the epithelium, as is seen in those affected with catarrh. With some of the pellagrous, in all seasons, diarrhœa is one of the most constant accompaniments, and at the same time unmanageable, and in many cases it proves to be the direct cause of death. The *urine* offers some noticeable particulars in pellagrous mania, but more of a negative than a positive nature. Thus, while other classes of the insane discharge a urine of a very deep colour, loaded with an abundance of phosphates, and of greatly increased specific gravity, on the approach and at the time of the paroxysm, the urine of the pellagrous insane is of less specific gravity, and undergoes little change in either the period of excitement or that of calm.

Of the functions of animal life, motility is that which undergoes the greatest changes. More than erythema itself, as diagnostic of this disease, is a singular rigidity, especially of the extensor muscles, and hence the preference of the patients for movements of flexion and contraction. Some of them will rest firmly on their feet, but they take neither an erect nor a sitting posture; or others will hold the arm out, semiflexed and rigid. On occasions this tendency is carried so far as to produce varices, &c. *Sensibility* is generally less in pellagrous insanity than in ordinary health, as tested by the induced electrical current, according to a method proposed by the author. An exception to this difference is found in the frontal region, which is as sensitive, if not more so, in the disease under notice than in health. The insensibility in other respects shows itself in the disregard of cold, or of great heat even to the extent of its causing burns and scalds. Dr. Lombroso has not seen any form of insanity peculiar to pellagra, or which would seem to distinguish it from other forms of mental derangement.

The ordinary complications of mania pellagrina are the well-known pellagrous ulcers of the intestine, gangrenous bedsores, paralysis of the bladder and of the inferior limbs, œdema either partial or general, scurvy, and persistent anæmia. Dr. Lombroso remarks on the singularity of the absence of diffused tubercle in pellagra, although this disease prevails in the province which furnishes the materials for his observations, and it is known to be common among the insane generally. In its stead come cases of cardiac complication—1st, of carditis; 2dly, of hypertrophy of the heart; and 3dly, of atheroma. The terminations

of pellagrous mania are exhibited by the author in histories of different cases. First is that of *suicide*, committed in two instances by the patients, both of them females, the one 58, the other 47 years of age. Dr. L. gives as the immediate cause of death in the cases he relates, paralysis, ulcerated colitis, myocarditis, &c.

Doctor L., differing from most of those who have written on the subject, has frequently met with lesions of the heart, which he regards as primary affections in pellagrous maniacs, whereas those of the lungs, and chiefly pneumonia, are secondary. Sometimes tuberculosis is arrested and takes a retrograde course. The most frequent anatomical change perceived after autopsy was ulceration of the mucous membrane of the colon.

The cure of pellagrous mania is, in the author's experience, a comparatively easy matter. In fifty cases of the disease, he could count twenty cures, and of these there were but two relapses; six were cured spontaneously, and, as it would seem, by good food. He points out a peculiar form of pellagrous mania, which he believes to have escaped the notice of previous writers. It consists in an arrest of growth of the body, and above all, of the organs of generation, with, at the same time, precocity and permanent activity of the intellectual faculties. Six cases of this nature came under his care, and of these five were cured and one was in a course of recovery. Of the four cases the histories of which are given, two were females and two males.

The *Medical Journal of Rome* is quoted in the August number of the *Italian Journal* for some practical observations by Dr. Tassi on the use of arsenic in certain surgical diseases. Two cases of *lupus erodens* are described, in which the application of an arsenical powder called after *Fràte Cosimo* was attended with complete success, and the cicatrices were observed to be more equal and uniform than usual. We are told by the same author that the efficiency of arsenic in destroying syphilitic, scrofulous, and herpetic virus is unequalled. Scrofulous ulcers which had been rebellious to the topical application of iodine, mercury, and various tonic remedies, yielded wonderfully to a weak solution of arsenic in rose or mint water. In cases of obstinate phagedenic ulcers of a venereal character which had resisted the use of mercurial preparations, Tassi added to a solution of sublimate a grain or so of arsenic with the best effects. The free use topically of arsenic in ulcers of the lower extremities with callous border, occurring to the inhabitants of paludal regions, or from specific causes, was quite successful, conjoined with methodical compression, which of itself had produced no effect. The author adds that modern therapeutics admit the almost specific effect of arsenic in parasitical diseases. In syphilitic cachexia he has used Donovan's solution as modified by Ferrara, with the best results.

Doctor D'Ormea, assistant clinical physician for the treatment of venereal cutaneous diseases in the University of Bologna, speaks of the healing virtues of Fowler's solution in epithelioma; and confirms the observations of Professors Gamberini and Rizzoli to the same purport. He gives the histories of six cases of females—all of them prostitutes—who had fungous growths at the orifice of the urethra or at the borders of the internal labiæ, and who had been treated by mercurials and cauterization, and other remedies without effect, but who were cured by the external application of Fowler's solution. In three other cases, one of a man, and two of females, still under his care when he wrote, there was evident amelioration of the disease. In the man the epithelioma with ulceration was seated on the soft palate.

The solution of perchloride of iron is strongly recommended in anthrax by Dr. Giuseppe, who is attached to the Great Hospital in Milan. The author points out the various diseases and local structural changes in which this remedy has been applied with more or less success, since its first introduction into practice in 1853. Among these we find leucorrhœa with relaxed state of the *os uteri*, and especially vegetations and granulations in the vagina, chronic or passive menorrhagia, and in the latter days of excessive and unduly prolonged menstruation. In cases of this nature, the following injection was used: decoction of marshmallow two-thirds, with which is to be mixed four or five drachms of perchloride of iron of the density of forty-five degrees of Beaumé's aerometer, to be repeated two or three times daily. This formula was also employed in case of superficial erosions and fissures of the *os uteri*, and as an auxiliary remedy in descent

and slight obliquity of this organ. As an hæmostatic for external hemorrhages Viente used the following formula: distilled water, three and a half ounces; sesquichloride of iron, from forty-five to seventy-five grains. Lint or muslin compress moistened with this liquid is to be applied to the bleeding part and retained on it firmly by a roller, or by pressure in other ways. For an internal hæmostatic he employed another formula, viz., distilled water, eight ounces; sesquichloride of iron, twelve grains; sugar, q. s. Of this solution the patient will take a spoonful (tea or table not stated) every hour, or half hour, or even every fifteen minutes, according to the extent and persistence of the hemorrhage. A solution of the perchloride of iron has also been applied with success in chronic ophthalmia and vascular growths in which the customary astringents, cauterizations, and even excisions, had been tried without effect. Follin used it also with benefit in subacute conjunctivitis with ulcer of the cornea. The usual form of application was to put a drop of a solution of 15° to 20° density of Baumé, with a pencil or glass rod, every second day. Great pain is felt by the patient for the next fifteen minutes, and after it intense heat, which lasts for many hours. The remedy was also given internally by Devergie in cutaneous affections and in scurvy. Military surgeons have had occasion to test the efficacy of the sesquichloride in hospital gangrene, and in many instances have recorded their satisfaction with the results of its use in such cases.

Dr. Giuseppe gives accounts of five cases of anthrax in which he employed sesquichloride of iron topically to the diseased structure, and in all of them with entire success. The names of four other persons similarly affected are given by the author, and the reports of their cases are equally satisfactory. The period of treatment varied from sixteen days to a month. In the five cases of which we find a special record, deep crucial incisions were made before applying the sesquichloride of iron, which Dr. Giuseppe believes to be the best substitute for the actual cautery. Numerous cases of varices have been entirely cured by the remedy, in the experience of Vallette, Petrequin, and Desgranges.

Animal vaccination, or the introduction into the human subject of vaccine matter from the cow, is practised on a large scale in Venice and Naples, and arrangements are being made for carrying out similar measures in Florence.

In Venice, animal vaccination has been practised for the last thirteen years, under a commission, consisting of the municipal physician, two other medical men, a surgeon, and the municipal veterinarian of Venice, under the presidency of the physician of the province. Such is the confidence now placed in its utility and success, that applications for vaccine matter are made, not only from all parts of the Venetian territory, but also from Istria, Dalmatia, and even Egypt. The benefits of vaccination, with regenerated matter, are extended, with the happiest results to classes of persons who would otherwise be neglected. Experience has shown that even where the vaccination of a child had only been productive of a small pustule, the matter thence procured and inserted into other children has produced full pustulation.

In Florence, Dr. Galligo procured from Dr. Negri, of Naples, genuine matter from the cow, which he inserted sixteen times, with resulting regular and characteristic vaccine pustules, without any symptom of unusual local irritation.

We have noticed the wise measures of preventive hygiene, in regard to vaccination, adopted by the municipal governments of some of the great Italian cities, both as important and instructive in themselves, and as suggestive of analogous measures in the different cities and towns of the United States.

An account is given in the Journal of the Royal Academy of Medicine of Turin, of the spontaneous appearance of cowpox in cows, on the royal grounds at Vernecia, Piedmont. Professor Bassi collected in tubes, from the pustules thus produced, vaccine matter, which he inserted into several children with entire resulting success.

Professor Pellizari details cases of impetigo, twenty-eight in number, following vaccination, in the district of Faenza. We deem it needless to do more here than to give his conclusions, which are to the effect that, as the eruption did not show itself in the soles of the feet or palms of the hands, the eyelids or hair, nor in the mucous membrane of the mouth, nor in the genital organs, nor anus, it was wanting in the characteristic features of syphilis; the ulcers, when they

existed, had not the usual indurated border. They could not, if they were syphiloid, have been cured as were those seen on the children, whose cases are described. They were entirely cured in thirty days. There was, moreover, no swelling of the gland in the neighbourhood of the cutaneous sores; no erythematic spots, nor papulæ, nor crusts on the hairy scalp. None of the women who nursed the children showed any symptoms of syphilis; and in addition, it should be mentioned that an analogous cutaneous affection was observed in others who had not been vaccinated in the same year. The author believes that the impetigo, in the subjects that were brought to his notice, was spontaneous in its origin, and should be classed with other cutaneous disorders following vaccination. The curative measures recommended by Dr. Pellizari were chiefly of a hygienic character: he advised, however, the revaccination of those children, who, besides having impetiginous, presented vaccinal crusts and cicatrices of an imperfect character.

Dr. Giuseppe tells (in the July number of the *Journal*) of retarded development of vaccine pustule in three cases. The first was one of seven children, vaccinated at the same time, with the same matter, six of whom had vaccinia perfectly in the usual period of eight days; but in this one nothing could be seen at the expiration of this time but the remains of the mark made by the puncture for the insertion of the vaccine matter; and it was not until the twentieth day that, after febrile excitement, there appeared six vesicles which went through their course regularly. On another occasion Dr. Giuseppe vaccinated ninety persons, two of whom, a child and a youth of eighteen years, seemed not to have taken the vaccine, as there was not, on the eighth day, the slightest trace of a puncture on the arm; but on the thirteenth day from the operation the vesicles began to show themselves, and pustulation was completed on the eighth day of their appearance. Dr. Messina relates a case of vaccination of a child ten years old, in which there was every appearance of entire success up to the seventh day, after which a real umbilicated vesicle disappeared for twelve days. There was then a return of vesicle and areola, followed by suppuration and desquamation in the usual order.

In a series of letters addressed to the editor of the *Italian Journal*, from March to June, 1867, inclusive, Professor Gamberini investigates the question of the transmissibility of syphilis by vaccination. We cannot, for want of room, follow the author in his course of argument on the occasion, but shall give some of the conclusions which he has reached. Numerous facts show that vaccine matter taken from syphilitic subjects produces only true vaccinia in healthy persons. We cannot admit the existence of a syphilitico-vaccine pustule, or one containing both kinds of virus. Such a pustule ought to have its appropriate physiognomy; but none such has been witnessed. In many cases of disease following vaccination, it is an error in diagnosis to regard them as syphilitic; and it may be said that in all the alleged cases of the transmission of syphilis by vaccination, there are too many breaks and inaccuracies in the argument to allow of a correct judgment being formed. One great cause of fallacy on these occasions is the coincidence of the evolution of latent syphilis with vaccination, and receiving the latter as the cause of the former. Syphilitic patients taken with smallpox, measles, &c., do not communicate syphilis to healthy persons near them, and why should vaccination act in a different manner? When artificial inoculation is performed with mixed vaccino-syphilitic matter, the sole result is a pustule of venereal character. There may exist vaccinal and syphilitic pustules on the same subject, and hence a vaccinator may incur the risk of imparting to one healthy person vaccinia and to another syphilis.

A case of supposed curative power of smallpox in alarming diphtheria is related by Dr. Lombroso in the July number of the *Journal*, 1867. He gives also the history of the case of a peasant girl, twenty-two years of age, maniacal from an early age, and at the time of writing in a state of dementia, who was restored to sanity by becoming the subject of natural smallpox.

Syphilography takes up, as might be expected, considerable space in the *Italian Journal*. One of the longest articles, extending to three numbers of the *Journal*, is by Dr. Padova, of Pavia, on the question, whether a mother

labouring under syphilis can transmit this disease to her child through the medium of her breast milk? The writer takes an historical review of the opposing opinions of syphilographers, from the beginning of the sixteenth century down to the present day; and he gives a series of cases and a number of experiments by many of them in illustration or enforcement of the arguments on both sides. He reaches definitively and decidedly the conclusion, important both in a pathological and medico-legal point of view, that the milk of a mother infected with syphilis is not a vehicle for the transmission of the contagion to her child. If a syphilitic child is presented to a physician, he will be free to deny that it has become so by the milk sucked from its mother or wet-nurse, and it will be his business to show that the child had the disease from birth, or had contracted it by chance contact with the syphilitic poison.

Dr. Lombroso gives the melancholy history of the case of a man, aged thirty-three years, who, after long syphilitic poisoning, became affected with mania, general osteo-porosity, adipose degeneration and abscess of the muscles, cystitis, vegetations of the aorta, and spinal meningitis. Some of these organic lesions were evinced by symptoms during life—others were revealed by a *post-mortem* examination.

In a letter to the editor, Dr. Nicola, of Civita Vecchia, furnishes an account of his treatment of a case of syphilitic pemphigus associated with chronic gonorrhœa and soft ulcers of the glans and the prepuce, swelling of the glands and iritis, in a man forty-one years of age. He designates his curative means as *Phenico-Sulphitic*, used in the following manner: We should premise that the skin of the patient was, with the exception of the face and hands and the left leg, nearly covered with bullæ and dried scabs, which, when detached, left an ulcerated surface exposed. The intermediate space was occupied with a reddish coppery eruption. Having first given a purgative, Dr. Nicola directed a careful bathing of the crusts and ulcers every six hours with a solution consisting of 80 parts of orange-flower water and 20 of liquid phenic acid; the parts were then covered with fine linen rags wet with the following liquid: R.—Glycerine and liquid phenic acid, of each 2 oz.; balsam of Tolu, half a drachm; laudanum, 20 drops. In the morning and evening an ointment, consisting of sulphite of soda and lard, washed, of each 1½ oz., was to be rubbed into the inguinal and axillary regions. This constituted the topical treatment. The internal remedies were, an ounce of the rob of Affecteur, four ounces of the decoction of pollini, every morning; and a powder consisting of 45 grains of sulphite of magnesia, 12 grains of bicarbonate of soda, and 8 grains of sugar, to be taken an hour before dinner. By the twenty-eighth day of the above treatment the ulcers had become entirely cicatrized, the swelling of the glands dispersed, and the only traces of the bullæ were red spots. The cure was retarded by the inability of the stomach to retain always the substances prescribed. Attention was now directed to the gonorrhœa, which, with the exception of some periods of suspension, had lasted for several years. An injection, three times a day, of the following mixture was prescribed: R.—Distilled orange-flower water, 4 oz.; liquid phenic acid, 1 oz.; distilled peppermint water, 1½ oz.; laudanum, 1 drachm. The use of this injection for five days sufficed to cure the gonorrhœa; but at the expiration of this period there supervened intense headache, especially in the frontal and supra-orbital regions, tension of the eyeballs, greatest at night and more particularly between 9 P. M. and 3 A. M., wakefulness and fever, which lasted three days. At this time the left eye became red, tearful, and intolerant of light, and in the course of twenty-four hours violent iritis showed itself. Recourse was had to active purging, bloodletting from the arm to the extent of 10 oz., and restriction to a rigorous diet; and the following collyrium was applied to the eye: R.—Sulphite of soda, 1 drachm; distilled lettuce water, 4½ oz.; extract of belladonna, 6 grains. The use of the sulphite of magnesia and of the rob was continued. On the eighth day from the attack of cephalalgia, fever and iritis, and the redness of the eye had disappeared; the pupil was restored to its natural condition, and the sight was entirely recovered. Discontinued the rob, and in its stead Dr. Nicola directed the patient to take of syrup of gentian and dulcamara 20 oz., iodide of potassium 6½ drachms, in the dose of a tablespoonful every morning. This syrup, together with the sulphite, was continued for

rather more than three weeks, at the end of which the patient left the hospital entirely restored to health.

A case of venereal exostosis of the sternum and the left tibia in a man thirty-three years of age, is related by Dr. Carmelo, in the *Journal*, as having proved intractable to the iodide of potassium in doses increased to forty-five grains daily, and yielding to the deuto-phosphate of mercury, in doses of one grain in the day, continued for two months.

Dr. Fidele di Fieri, who wrote an essay on this mercurial salt, gives it the preference over all the other preparations of mercury, and extols its remedial powers in gout, phthisis, convulsions, sciatica, glandular engorgements, asthma accompanied by serous extravasation in the pleura and pericardium, nephritic pains, and mucous deposits in the urine, gastralgia, osteocope, eruptions with scabs; all of these disorders having in certain persons a syphilitic origin.

Dr. Minteforte, in a report on the clinical practice in the syphilitic hospital at Palermo, claims that great benefit was derived from phenic acid, five parts to water one hundred, in syphilitic ulcers, applied by means of lint. In syphilides, generally, the iodide of arsenic was the preferred remedy; and he states that subcutaneous injections constitute the best means of cure in some cases.

There is a long paper, retrospective and clinical, on blennorrhagic ophthalmia, by Dr. Rosmini, in the November and December numbers of the *Journal*. His practice in this disease is to cauterize freely the palpebral conjunctiva, both of the upper and lower lid, from one commissure to the other, while taking care to raise as much as possible the lid from the ball of the eye. The process is to be repeated in the less violent cases twice a day; and only when the purulent discharge continues for some days, are injections of a solution of crystallized nitrate of silver—two grains to an ounce of water—to be used at the same time. This may be increased to three or four grains to the ounce if the pyorrhœa returns after cauterization by the solid nitrate.

Professor Profeta, lecturer on syphilography and dermatology in the University of Palermo, makes extended observations, critical and historical, on "the alleged gonorrhœal articular rheumatism," in the July and August numbers of the *Journal*. He shows that the only relation of rheumatism to gonorrhœa is that of simple coincidence in the time of their attack. There is nothing distinctive in the complications of the alleged compound disease from what is seen in those of acute articular rheumatism, whether we have reference to inflammation of the lungs and pleura, or affections of the heart. He extends this assertion to the occurrence of serous iritis or inflammation of the membrane of Demours, which, he says, is not entitled to be called metastatic or sympathetic ophthalmia, "a name only fitted to create confusion in the science." The only concession that can be made in favour of the gonorrhœal etiology of articular rheumatism is thus stated by Foucart, viz., that gonorrhœa may constitute a kind of predisposition by which those labouring under it are more susceptible to the actions of external agents and especially the impression from cold, and thus become victims to arthritis, or acute articular rheumatism. Dr. Profeta, making use of numerical proofs of the correctness of his views, tells us, that in more than a thousand cases of gonorrhœa which have come under his notice, and of which four-fifths were men, he has seen only twenty-two of articular rheumatism to which some might give the name of gonorrhœal; but in all of this list there had existed either a predisposition to rheumatism or powerful rheumatismal causes had been in operation. Meignen is quoted as furnishing a statistical return, from the Antiquaille Hospital at Lyons, of 2423 cases of urethral gonorrhœa in men, and in these there were but 68 cases of articular rheumatism.

Doctor Danieli, in the *Journal of Medical and Veterinary Pharmacy*, gives the details and results of his treatment of venereal buboes by injections of sulphate of copper. When the bubo has suppurated or has evidently reached its greatest extent he makes a small opening at its summit with a lancet and empties completely the tumour, and then injects once or twice a solution of sulphate of copper in the proportion of one of this latter to one hundred of water, or say eight grains to the ounce, so that the liquid will come in contact with the entire surface of the abscess. This is to be completely emptied of the injection,

and on the part is applied a thick pledget of lint wet with lead water, and over this again a graduated compress secured by proper bandaging. The patient will be enjoined to keep at rest. This treatment is to be repeated daily, until the fourth or fifth day, when the injections will be discontinued; but the saturnine lotions and compression still applied. The suppurations now become small and serous and of a citron colour, and between the eighth and tenth day it ceases entirely, and the small wound made with the lancet is healed and the patient is well.

The Journal touches on some other subjects than the specialties which constitute its main theme. Thus, for instance, we find a case of stricture of the urethra removed by the urethro-tenotome of Doctor Riccordi, and a plate exhibiting the several parts of the instrument and the manner of using it.

Doctor Ambrosoli communicates, in the February number of 1868, an account of double vagina and double uterus with a double cervix in a prostitute aged twenty-six years, of robust frame, and who had never suffered from any disease, except the gonorrhœa, for which she was admitted into the venereal hospital. On separating the lesser labia two vaginal orifices are seen; the one on the right side being smaller than that on the left. The septum between the two cavities consists of a duplicature of the mucous membrane of the vagina, which in its ascent became gradually thinner, and at its attachment to the cervix of the uterus resembled a most delicate membrane. Dr. A., on careful inspection, discovered another still smaller and more raised cervix and os in connection with the right vaginal cavity. The menses flowed from each of the two passages. Only one of them, the left, was affected with gonorrhœa; the right remaining free from disease. This woman never had children. The author precedes his account of this case with a bibliographical notice of the writers on anomalies of the uterus and vagina. In the September number of the Journal, 1867, we see an account by Dr. Rabe, of Dresden (*Monatsschrift Gebartsk.*) of a case of double vagina and probably of double uterus—in a peasant girl twenty-eight years old.

Here we close our bibliographical notice, without criticism or comment, of the Italian Journal of Venereal Diseases and of Diseases of the Skin, so far as relates to the original department, but without our taking into account its appropriately selected matters. Our readers, looking to the freshness and instructive nature of the subjects now brought to their notice, will, we believe, join us in the wish to be kept in frequent communication with the intelligent and zealous writers and clinical teachers who now contribute to the pages of our valued and esteemed contemporary of Milan.

J. B.

ART. XXII.—*Lessons in Physical Diagnosis.* By ALFRED L. LOOMIS, M. D., Prof. of Institutes and Prac. of Med. in Med. Department of Univ. of New York, etc. 8vo. pp. 159. New York: Robert M. DeWitt, 1868.

In his preface to the book, Dr. Loomis informs us that this volume is published in compliance with numerous requests made by members of his class in Physical Diagnosis. "Had I," he says, "attempted originality on such a subject, I should have committed error. My sole object has been to collect into a plain and comprehensive compend the result of the research of many inquirers." This is rather a modest introduction, but one not without its attraction for the student; for, after all, the most successful teachers are not always the most original men, and in many of the recent works on this subject a good deal of confusion in the minds of students is caused by the attempt to overthrow existing theories. Our author is certainly not over solicitous to obtrude any peculiar views upon the profession, while it is equally evident that he is quite familiar with those professed by the best and most recent writers.

The arrangement of the contents of the book is as follows: 1st. The signs which diseases of the lungs and pleuræ furnish are enumerated, and, to some

extent, their mechanism explained. Then the special diseases of these organs, and the signs by which they are made known to us are considered. 2d. The same method is observed in treating of diseases of the heart; and 3d and finally, the diseases of the abdominal organs are taken up. This arrangement presents some advantages to the student, as by it he can very readily compare the signs of one disease with those of another. Generally, in books of this kind, the physical methods of diagnosis as applied to diseases of the liver, spleen, kidneys, and stomach, are somewhat neglected; but we are glad to see that our author has accorded to them their full share of attention. Very useful also will be found the diagram showing over what portions of the præcordium we are to listen for murmurs caused by diseases of the different valves; and a similar remark will apply to the one copied from Gairdner, to show the "physiological action of the heart in connection with its external manifestations," and to those exhibiting the relative lengths of the two silences in different degrees of frequency of the heart's action.

The book, however, in its present condition is incomplete, and will not, we fear, be found entirely satisfactory to those who desire to know something more about a sound than that it occurs in such and such diseases. As an example of what we mean, and for the purpose of giving our readers a specimen of the author's style, we quote the following, which is positively all that is said about metallic tinkling:—

"Another of the adventitious sounds is that which is termed metallic tinkling, its name being sufficiently descriptive of its character. It sounds like the dropping of a pin or a small shot into a metallic vessel. A single one or a series of tinkling sounds may be produced by the act of speaking, or by the movements of inspiration and expiration, but it is especially consequent upon the act of coughing."

"The sound announces the existence either of a very large pulmonary cavity or of pneumo-hydrothorax. Dr. Walshe regards it as the echo of a bubble bursting in a liquid shut up in a spacious cavity which also contains air."

No mention is made of the sound known as amphoric echo, which is frequently heard in precisely the same conditions as give rise to metallic tinkling, and by many auscultators is looked upon as a modification of the latter sound. A little further on in the book, under the head of "Pneumo-hydrothorax," there is a diagram apparently copied from, but not credited to, Dr. Da Costa's book on Medical Diagnosis, in which drops of liquid are represented falling from the lung into the effusion below; and this is the only reference to this or to any other of the numerous causes which have been assigned to the adventitious sound by different investigators.

The classification of the adventitious sounds is simple, the author rejecting all unnecessary refinement. He follows Fuller, however, in the substitution of the term "mucous click" for "crackling," an alteration which we can scarcely regard as an improvement, as the word "crackling" gives quite as good an idea of the character of the sound as "mucous click;" and even if it did not, we doubt the propriety of attempting to change a term so generally accepted.

The book bears evidence of hasty preparation, for inaccuracies have crept in which a more careful revision would have excluded. Thus, in enumerating the different regions into which the surface of the chest is divided, our author speaks of the inferior scapular region. Almost in the next page, when he gives the boundaries of these regions, it is called the infrascapular. Now, we do not suppose that Dr. Loomis himself would contend that these terms, in this connection, are identical. Also in giving us the signs of pleurisy, the fact that the roughened surfaces of the pleuræ occasionally give rise to a friction fremitus appears to have been overlooked; so, too, that occasionally in peritonitis friction may be both felt and heard.

In describing the boundaries and contents of the different regions, the language used bears such a remarkable similarity to that found in a corresponding part of Dr. Fuller's work on diseases of the chest, that it is impossible to believe that the resemblance is accidental; in some cases whole sentences being transcribed.

We have spoken somewhat freely of the defects of the book, but we think if,

in future editions, more care is bestowed upon the explanation of the different signs, it will prove a valuable addition to the library of the student. As it is now, it can be regarded as little more than a synopsis of a course of lectures.

The printer and publisher have both done their part in a commendable way; there are very few and unimportant typographical errors, and the diagrams with which the book is illustrated are creditably executed. J. H. H.

ART. XXIII.—*Diseases Peculiar to Women, including Displacements of the Uterus.* By HUGH L. HODGE, M. D., etc. etc. "Nullius addictus jurare in verba magistri." With Illustrations. Second Edition, revised and enlarged. 8vo., pp. 531. Philadelphia: Henry C. Lea. 1868.

UPON the appearance of the first edition of this treatise, we expressed our high estimate of it as an original and practical monograph of the interesting class of diseases of which it treats. In the edition before us, the entire work has undergone a careful revision. Many additions have been made to the original text, the result of further observation and reflection and of the study of the many excellent works which have recently been issued by authors whose opinions and practice are deservedly held in high estimation. The chapter on uterine inflammation has been greatly altered and enlarged. "The object of the author," as he informs us, "was not merely to present what he deemed a more correct theory and practice in inflammatory diseases of the uterus, but also to insist that a very large proportion of the so-called cases of metritis are in reality but examples of irritation, where inflammation has subsided or where it has actually never existed." Indeed, the chief aim of the entire treatise is evidently to exemplify the nature, consequences, and treatment of nervous irritation, as distinct from inflammation.

To the subject of displacements of the uterus especially attention has been given. The author estimating these displacements as of the highest importance, while he believes them to be seldom treated on scientific principles.

The third part of the work is devoted to a consideration of sedation—a condition of the tissues in direct contrast with that of nervous excitement or irritation.

Prefixed to the present edition is a chapter in which Dr. H. has presented a general view of the opinions of many high authorities on the subjects respectively of irritation, congestion, and inflammation, with their sequelæ and treatment, in contrast to those advocated in the work before us; with the view that the difference and practice may be more distinctly observed, and, as the author hopes, some valuable truths elicited.

While, with great deference, we should feel inclined to differ from Dr. H., as to the accuracy of one or more of his deductions, we nevertheless receive the work before us as one embracing the teachings of a faithful, accurate, and cautious observer.

D. F. C.

ART. XXIV.—*Materia Medica for the Use of Students.* By JOHN B. BIDDLE, M. D., Prof. of Mat. Med. and Gen. Therap. in Jefferson Medical College, Member of the American Philos. Soc., etc. etc. Third edition, enlarged. With illustrations. 8vo. pp. 384. Philadelphia: Lindsay & Blakiston, 1868.

IN the preface the author informs his readers that this, the third edition, has been carefully revised and considerably enlarged. "Besides several substances of established reputation, which appeared to the author to have been overlooked in previous editions, the following of more recent introduction into the materia medica are discussed in the present edition, viz: Calabar Bean,

Woorara, Coca, Guanara, Mate, Rhigolene, Bichloride of Methylene, Compounds of Amyl, Tetrachloride of Carbon, Nitrous Oxide, the Sulphites and Hyposulphites, Carbolic Acid, Antimoniated Hydrogen, Iodide of Ammonium, Iodide of Sodium, and Iodoform. The late valuable addenda to therapeutics—the *hypodermic method* of introducing medicines into the system, and the *atomization* or *pulverization* of fluids—are also treated of at length.”

These matters are treated in a very general way, yet sufficiently, perhaps, to satisfy students who regard this volume as a full syllabus and hear the lectures of the author. The work seems not designed to be a full exposition of the *materia medica*, but simply to embrace outline descriptions of the articles and subjects named, which the student may complete in the lecture-room, or by reference to more elaborate treatises on this difficult subject. The following extracts, taken without selection, illustrate generally the author's method of treating each article. “*Absinthium*—Wormwood. The tops and leaves of *Artemisia Absinthium*, or Wormwood (*Nat. Ord. Asteraceæ*), a European plant, naturalized in New England, are ranked among the aromatic bitters, but are not now much employed. They may be given in *infusion* (a troyounce to boiling water Oj).”

“*MATE*.—Under this name, the dried leaves of the *Ilex Paraguaiensis*, a small tree or shrub of Paraguay, cultivated also in other parts of South America, are extensively used as a beverage throughout the Atlantic region of that continent. *Paraguay tea*, as it is termed, has a balsamic odour and bitter taste, and contains a principle identified with *caffèina* and *theina*, and also tannic acid.”

W. S. W. R.

ART. XXV.—*A Theoretical and Practical Treatise on Midwifery, including the Diseases of Pregnancy and Parturition.* By P. CAZEAUX, Adjunct Professor in the Faculty of Medicine of Paris, etc. etc. Revised and Annotated by S. TARNIER, Adjunct Prof. in the Faculty of Medicine of Paris, etc. etc. Fifth American from the Seventh French Edition. By Wm. R. BULLOCK, M.D. With one hundred and seventy-five Illustrations. 8vo. pp. 1124. Philadelphia: Lindsay and Blakiston, 1868.

JUST before a call was made for a seventh edition of his able work on the Theory and Practice of Midwifery, M. Cazeaux was consigned to the tomb, and the preparation of the seventh edition, of which the one before us is a translation, was intrusted to Professor S. Tarnier, with entire liberty to remodel the treatise according to his judgment, making whatever alterations should appear to be required; whether the suppression of certain passages, or the introduction of whatever new matter might be deemed necessary in order to bring the treatise to a level with the present views held in respect to the theory and the practice of obstetrics. Acting upon this free charter, M. T. has performed very skilfully and thoroughly his office of editor.

The plan of the present edition has been so completely modified that it may be regarded as an altogether new work. The chapters are grouped in eight principal parts. The first part treats of the anatomy and structure of the female organs of generation, and of their functions. The phenomena which these organs exhibit at certain periods being also very properly considered as the preludes of generation, render their preliminary study indispensable to all who would understand the changes which they undergo during the state of pregnancy. In the second part are examined the many and important modifications which certain of the female genital organs undergo during gestation. Subsequently is entered upon the study of the first cause of all these changes, to wit, the fetus and its appendages, which are traced through the various stages of their development. From this examination are deduced the signs of pregnancy.

Labour is the subject of the third part of the treatise. After the consideration of labour, properly so-called, comes the study of the delivery of the after birth, and of the treatment of the puerperal state, with a consideration of the

attentions demanded by the woman during and after labour. An article also is devoted to the apparent death of new-born children. The consideration of the pathology of pregnancy, the subject of the fourth part, is greatly extended. Entire new chapters have been introduced in reference to the diseases of gestation, the alterations to which the placenta is subject, and the death of the child during intra-uterine life.

In the fifth part, devoted to difficult labour, are treated in detail, deformities of the pelvis and all other causes of dystocia, the manner in which they respectively operate, their situation, whether in the mother, the child, or its appendages, the means by which their presence may be detected, the indications they present, and the means for their fulfilment. In the accounts given of hemorrhage and puerperal convulsions and of their indications will be found some new considerations. Artificial delivery of the after-birth, and the accidents to which it is liable are carefully considered.

The editor has introduced a new part (part 6), devoted to obstetrical therapeutics. It includes two chapters, the first being devoted to ergot, and the second to the effect of a debilitating regimen, and a certain course of medication upon the development of the child during intra-uterine life. The seventh part comprises a discussion of the employment of anæsthetics in labour, an account of the use of the tampon, and of all the obstetrical operations. The eighth and last part is exclusively devoted to the hygiene of the infant from birth to the period of weaning.

It is impossible by mere verbal description to give any accurate idea of the manifold improvements the work has received at the hands of its talented and accomplished editor; it is only by comparing the present with the former editions that the full extent and value of M. Tarnier's labours will be understood.

D. F. C.

ART. XXVI.—*Second Annual Report of the Metropolitan Board of Health of the State of New York, 1867.* 8vo. pp. 320. New York, 1868.

THIS Report, which embraces the proceedings of the New York Board of Health for the twelve months ending October 31st, 1867, is one of deep interest to the medical statistician and the political economist. From such documents, also, it is that the pathologist derives his materials for the construction of a reliable system of etiology, and the hygienist a proper and effective plan for the prevention of the more common and destructive diseases.

The report is well drawn up, and, in its several appendices, furnishes the details of the medical history of the territory embraced within its scope—the nature of the prevailing diseases, the condition of the localities, and the character of the communities among which they occur; together with the result of the measures undertaken with a view to remove, if possible, their endemic causes.

The district over which the jurisdiction of the Metropolitan Board of Health extends is composed of the city and county of New York, the counties of Kings, Westchester, and Richmond, and the towns of Newtown, Flushing, and Jamaica, in the county of Queens.

The total number of deaths in the city and county of New York, during the twelve months ending the last week in September, 1867, was 23,443. In Brooklyn, during the same period, the deaths were 8589. This aggregate of mortality includes all the deaths that occurred in the several public institutions situated within the limits of the counties of New York and Kings. In these institutions and in the other hospitals and asylums there were 4075 deaths. The deaths in New York, during the year ending as above, were 3152 less than in the preceding year. This gain in favour of life in that crowded metropolis may be claimed as the legitimate result of the improved hygienic condition of the city. Brooklyn shared equally with New York in this gain to the life and health of its people. Allowing for the absence of Asiatic

cholera as an epidemic, which in the period embraced in the report for 1866 destroyed 407 lives in the city, and 751 in the public institutions, against 88 deaths from the same cause in the succeeding year, the actual gain to the life and the sanitary condition of the city population is the more obvious; for the scourge of the previous year did not cease to menace the metropolis during the year 1867. The full significance of any such statistical evidence of gain to health and life will be appreciated only when another important fact is considered in regard to the unhealthful and epidemical influences which characterized the past summer. It was a season of incessant rains and of excessive atmospheric humidity extending over a wide extent of country; the larger towns suffering in consequence an unusual amount of fatal sickness. The infant mortality, and diarrhœal diseases, which continued through the summer, indicated a great degree of insalubrity. The deaths from these disorders, epidemic cholera excepted, nearly equalled the total mortality from the same causes and at like ages in the previous year. The statistical evidence presented would seem to indicate the fact that the gain has been mainly in the chances of life at the adult ages, and in those districts where the greatest amount of sanitary reform had been effected. By comparing the death record for the corresponding periods of the last two years, it will be seen that the districts of New York that had been most remarkable for insalubrity and high death rates, and in which sanitary measures had been most early instituted and most persistently enforced, though still less salubrious than the districts inhabited by well-housed and self-regulated classes, have experienced a relatively greater gain to life and to health.

The report presents an interesting review of the more prominent of the morbid causes which exist in and about New York, and of the measures which have been put in operation during the past year for their amelioration or removal. A general sketch is then given of the prevalence in New York during 1867 of yellow, typhus, and typhoid fevers.

Many of the special reports that make up the voluminous appendix to the general report are full of interest and instruction. The first three are respectively from the Sanitary Superintendent, the Superintendent of Tenement-Houses, and the Assistant Sanitary Superintendent. They present an exposition of the existing influences injurious to the health of the community, and of the means adopted with a view to their partial or complete abatement.

A report from the Registrar of Vital Statistics presents a summary of the census of the New York sanitary district, and of the record of deaths, marriages, and births, with some very just remarks on the improvements demanded in order to render more full and accurate the entire system of registration.

Under the head of "Infant death rates" we meet with the following important remarks:—

"The number of infants in New York that died before their first birthday was 7494, and in Brooklyn 3209. This is believed to be *little less than one-fourth of all the infants born alive in the year*; which is twice too high a death rate for the first year of infant life. But it is impossible to present this subject in the manner its importance demands until a full return is annually given of the births in each city.

"Upon this subject the Registrar would remark that he has good reason to believe that between one-ninth and one-tenth of all the children under five years of age in the metropolis, during one year, are, in the present state of the people, doomed to die in the course of the year. But if sanitary science is not a fable, and if the principles of physiology, and the lessons of experience and of medical observation are not altogether fallacious, it is true that fully one-half of this child mortality is preventible by sanitary measures.

"It is so important that the Board of Health, as well as the public generally, should neither be misled by nor become indifferent to this enormous waste of infant life, that we will here adduce a few facts which may aid in a discriminating interpretation of these high death rates of the child population. *First*, all history shows that, taken in a large way, the labouring classes are by far more prolific in child-bearing than the other classes of society. Another fact also appears to influence this result in regard to the prolific quality of the

labouring classes, though it has no relation to the physiological effect of their industrial and out-of-door occupations, namely—the fecundity of the classes (married) which are lowest in the social scale, and most degraded and improvident in their domestic life. This holds true especially in *the classes and the districts in which there is much sickness and high death rates*. Without stopping to present the statistical proofs and the physiological causes of this important law of fecundity in low-lived populations—a law that yet has many exceptions—we simply state the fact as it is.

“The *second* fact to be noticed concerning the excess of new-born children among the lowest classes is this, namely—that, as a rule, almost without exception, a high death rate in the nurslings and children under five years of age, in any city or district, is a very unerring index of an excessive death rate in the adult population of such city or place. Thus, if in one ward we find a high death rate in children, and if it is vastly higher than that in the children of another ward in the same city, then we shall find that the death rate is excessively high in the total number of the adult inhabitants of the first ward, while there is a very low death rate among the adults of the ward which buries the smallest percentage of its infants. Experience, then, proves that the infant death rate is a safe index of the general rate of mortality, both in the total population and in the adults of any city or district. *Lastly*, the respective death rates of infancy, adult life, and of the total population, in cities, wards, and larger districts, give valuable aids for the correct estimation of the state of the public health. And the infant death rate is found to be far the most trustworthy and quickly perceptible indicator of the local and other physical influences that affect the public health.”

From *smallpox*, only nineteen deaths occurred during the year 1867, in New York, and but two in Brooklyn. This is the smallest amount of mortality in those cities, from this source, during any one year, since 1829; it includes what, until 1859, was not included—all the cases sent from the ships under quarantine. *Six* cases only died in the city, and twelve at the small-pox hospital, on Blackwell's Island, where are sent all cases from on ship-board, from emigrant institutions, as well as patients from the city. During the year 1867, there arrived at quarantine twenty-eight ships with smallpox on board. In London, Liverpool, and other foreign ports the contagion was unusually prevalent. That so few vessels arrived with the disease is attributed in the report, mainly to the care, now exercised in embarking emigrant passengers at British ports, to examine their arms for the evidence of vaccination. The good results of immediate domestic quarantine, and the disinfecting of the clothing of the sick by boiling or burning, have been, we are told, abundantly witnessed in the numerous cases of varioloid and about one hundred cases of variola that occurred in the city during the year.

Measles, scarlatina, and diphtheria, in New York and Brooklyn, destroyed during the year 2175 of the infant population. As a persistent and subtle foe scarlatina is to be more dreaded than cholera. It would be truly fortunate if definite and effectual prophylactic means could be applied to control or extinguish it. Until such means shall be discovered, there is but one course to pursue—for sanitary authorities and families to enforce the most thorough cleansing and ventilation, with the immediate disinfection, by boiling, or equally adequate means, of all clothing, bedding, etc., worn and used by the sick.

Of *typhus fever*, 199 fatal cases occurred in New York, and 22 in Brooklyn. Each of these cases has an important history, and teaches a practically useful history in hygiene. An offspring of personal and domestic filthiness, darkness, stagnant foulness of air, and famine, typhus fever perpetuates its infective virus wherever its germs find a lodgment amidst any such surroundings as those that first engendered it. The severe and very snowy winter of 1866-67 so shut up the poorer classes of city inhabitants within their dwellings, that the malignant outbreaks and rapid diffusion of the fever threatened much harm to the tenebrous population.

The 404 deaths from *typhoid* or *enteric fever* in New York, and the 159 in Brooklyn, served, we are told, in a general way, and not unfrequently in a very particular manner, to point out local sources of unhealthfulness, and these,

mostly, in respect of drainage and the proper care of excrementitious filth. It is very pertinently remarked that, as the city sewerage system becomes more and more generally extended, the utmost care must be taken in order to prevent the sewers and their myriad connections from becoming a vast congeries of hidden, fever-breeding cesspools, from whence may emanate a poison that is capable of generating malignant disease among those who feel themselves secure under the impression that they are far removed from any of the causes of such disease.

During the autumn of 1866 there were numerous fatal cases of *erysipelas* and *puerperal fever*. In regard to the latter disease, much anxiety existed among thoughtful obstetricians in the down-town districts where it most prevailed. During the period included in the report there were 79 fatal cases of child-bed fever, and 116 of *erysipelas*, the latter occurring mostly in hospitals or in very filthy and crowded localities. The fearfully positive teachings of medical experience (we use the exact words of the report) in regard to the infectious and readily portable nature of *puerperal fever*, and in regard to the interchangeable character of this fever poison and that of *erysipelas*, have induced in all well-informed obstetricians in the cities referred to an especial degree of caution and conscientious effort to avoid all the causes capable of producing the latter, as a safeguard against the occurrence of the former.

"That there should have been only 60 cases of pyæmia in the two cities, and in a hospital population of nearly 20,000 patients of all kinds, might seem to be a matter of congratulation. But when we consider that, in a majority of instances, this destructive zymosis is engendered by foul air within crowded wards, and by the inherent defects of hospital construction and ventilation, this record, like that of fatal *erysipelas*, points specifically to unsanitary circumstances connected with the existing hospitals. Besides these sixty deaths by pyæmia, there were nineteen by *osteo-myelitis*, which, previous to the recent advances in surgical pathology, would have been recorded under the former name, or under that of surgical fever."

The total quantity of diarrhœal disease in New York and Brooklyn, week by week, month by month, and year by year, indicates with a kind of mathematical and chemical certainty the total death pressure of putrescence and defilement of the atmosphere in the sickly districts. The total number of deaths from diarrhœal diseases in the period included in the report is 4404. Asiatic cholera caused only 101 of these deaths.

An all-important circumstance has characterized "*the diarrhœal and cholera fields*," during the years 1866 and '67. It is that the boundaries and areas of these sections of the city were coincident and almost identically the same in the last as in the previous year. There was this difference, however: the extent of some of these fields of bowel disease was diminished, but only in those districts in which sanitary measures—the enforcement of cleanliness by scavenging and washing have been particularly thorough and unremitting during the summer of 1867. The fatal force or *lethality* of these diseases was apparently diminished in the latter districts. In certain localities that were in 1866, by the unusual rain-falls, saturated with surface moisture, and possibly by the wash of sewers, there was a greater amount of fatal diarrhœal disease, exclusive of cholera, in 1866 than in 1867. Similar experience in various undrained sections of Brooklyn taught the same practical lesson as did the persistent haunts of bowel diseases in New York—the importance, namely, of sanitary drainage and sanitary cleansing.

From *phthisis pulmonalis* 3286 deaths took place in New York during 1867, and 1161 in Brooklyn. Injurious occupations of a particular kind, or, rather, hurtfully conducted trades, unventilated, cold and damp workshops, churches, school-rooms, and other places of assemblage; still more, unventilated, damp and overcrowded dormitories, and close, unlighted and damp sitting-rooms are among the chief sources of pulmonary phthisis in our cities.

Our records show, according to the report before us, that the death rate by consumption is much greater in some districts than in others, and also in some classes of dwellings than in others. For example, it is found that in the southern half of the 21st ward—the wet flank of Murray Hill—the mortality from consumption bears a ratio to that in the northern and elevated half of the

same ward, which in 1867 was as 75 to 55—Bellevue Hospital being excluded from the records of the former section. It is found, also, that in particular blocks of dwellings the death rate from consumption is thrice greater than in other and better blocks, the census of population being the basis of the calculation.

We recommend this report to the careful study of all whose duty it is to investigate the causes of the unhealthfulness of cities and communities, with the view to the application of means that are adapted to improve their sanitary condition.

D. F. C.

ART. XXVII.—*Clinical Lectures on the Principles and Practice of Medicine.*

By JOHN HUGHES BENNETT, M. D., F. R. S. E., etc. Fifth American from the fourth London edition. With five hundred and thirty-seven illustrations on wood. 8vo. pp. 1022. New York: William Wood & Co., 1867.

To all who desire to obtain a correct idea of the somewhat novel views inculcated by Dr. Bennett in respect to pathology and practice, especially those on the treatment of inflammations and acute diseases generally, and of the facts and chain of reasoning upon which those views are based, we would recommend a careful perusal of the volume before us. Whether convinced or not of the correctness of the author's views as legitimate deductions from the data adduced in their support, the practical physician will nevertheless derive from the study of the treatise many suggestions calculated both to interest and to instruct.

In the present edition of these lectures there will be found many important additions. Thus, in Section 2, has been introduced an account of the molecular and cell theories of organization; while the description of the general laws of nutrition and of innervation in health and disease, and the account of inflammation also, and of tuberculosis, have been rewritten. In Section 3, new considerations on the subject of general therapeutics have been introduced; and, under different heads, reference has been made to the natural progress of disease; to the knowledge derived from an improved diagnosis and pathology; and to the fallacy of the change of type theory. An inquiry is, likewise, entered into as to our present means of treatment; and in support of the proposition that physiology and pathology constitute the true foundation for therapeutics.

The accounts given of the diseases of the nervous, digestive, and circulatory systems have been carefully revised and considerably enlarged. In Section 7 the author has tabulated every case of acute pneumonia treated by him in the Royal Infirmary of Edinburgh since the year 1848, in order to exhibit the efficacy of "the restorative, not stimulating," treatment advocated by Dr. B.

The subject of diabetes has been further illustrated by additional cases, and the results of a very full trial of sugar as a remedy for the disease are recorded. Certain views concerning the diagnosis and etiology of typhus and typhoid fevers have been reinvestigated. The result of a careful trial of the wet sheet in scarlatina is detailed, and a singular new fact indicated in the history of mercurial poisoning.

The "clinical lectures" of Dr. B. cannot fail to prove a valuable addition to every medical library. An acquaintance with their teachings will prove that the principles they inculcate are something more than hypotheses, and the practice they advocate more rational and successful than has generally been believed.

D. F. C.

ART. XXVIII.—*Hufeland's Art of Prolonging Life.* Edited by ERASMUS WILSON, F.R.S., etc. etc. 12mo. pp. 298. Philadelphia: Lindsay & Blakiston.

THIS work of Christopher W. Hufeland, the learned and experienced Professor of Medicine in the University of Jena, "in the olden time," has been before the public some three-quarters of a century, and may even now be consulted with profit as an authoritative treatise on the macrobistic science. As Dr. Wil-

son remarks, the reader of the book will probably be struck, as was the editor, with the little real progress which has been made in the science of living during the long period which has elapsed since the treatise was first written; and the feeling of a necessity of bringing its teachings up to the present state of our knowledge will be dissipated by its perusal. Either of its chapters, which discuss topics of a strictly hygienic character, might indeed be made with propriety and without the necessity of any material alteration, a part of a treatise of the present day on the "art of prolonging life." Hufeland appears on some points to be in advance of certain of the macrobiologists of the present age. While they class spirituous drinks among the alimentary fluids, and maintain that their use is important for the preservation of health, he ranks the use of "all preparations of spirituous liquors, under whatever name known, as tending in a particular manner to shorten life. They accelerate vital consumption in a dreadful manner; and make life, in the properest sense, a process of burning."

In presenting his edition of Hufeland's treatise, Dr. Wilson has adopted the very excellent English translation of 1794, with no other alterations than where required in order to adapt the style to the modes of thinking and feeling of our own times, corrections of certain German idioms and modes of expression, the omission of a few prosy disquisitions of no intrinsic value, and the addition of an occasional necessary note.

D. F. C.

ART. XXIX.—*The Principles and Practice of Obstetrics.* By GUNNING S. BEDFORD, A. M., M. D., Professor of Obstetrics, the Diseases of Women and Children, and Clinical Obstetrics in the University of New York, etc. etc. Illustrated by four coloured lithographic plates, and ninety-one wood engravings. Fourth edition, carefully revised throughout, and enlarged. 8vo. pp. 763. New York: William Wood & Co., 1868.

WE are pleased to find, by the appearance of a new (the fourth) edition within five years of the preceding one, that the work before us maintains that popularity with the obstetric student and with the medical profession generally to which its merits so justly entitle it. As a trustworthy guide to the present state of the science and the practice of midwifery, it is sufficiently copious and exact to become to the practitioner a reliable book of reference on questions of difficulty or doubt, where he can acquire correct information as to the present state of opinion and practice among the authorities of the profession, backed by the result of the author's own observations and deductions.

The chief additions made to this fourth edition consist in some further observations on the subject of anæsthetics, at the close of Lecture XLVII., and a new Lecture (XLVIII.), in which are discussed various topics of deep importance, such, for example, as chorea, paralysis, aberrations of mind, jaundice, etc., as complications of pregnancy and the puerperal state. The author claims to have, also, embodied in the present edition additional remarks on the subject of twin pregnancies; we can only say that after a very thorough examination of the work, we have failed to discover those additions.

D. F. C.

ART. XXX.—*Annual Abstract of Therapeutics, Materia Medica, Pharmacy, and Toxicology for 1867; followed by an original Memoir on Gout, Gravel, and Urinary Calculi.* By A. BOUCHARDAT, Professor of Hygiene to the Faculty of Medicine, Paris; etc. Translated and edited by M. J. DE ROSET, M. D., Adjunct to the Professor of Chemistry, Univ. Maryland, etc. 12mo. pp. 314. Philadelphia: Lindsay & Blakiston, 1868.

THE therapeutic annual of Bouchardat is widely known, and is everywhere received with respect. Dr. Roset has very fairly rendered the original text, and placed the substance of Bouchardat's summary for 1867 within the reach of all who are not able to read the French language. To the attention of this class, which ought not to be very large, we cheerfully commend Dr. Roset's work.

W. S. W. R.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *Influence of Certain Fibres of the Cardiac Branches of the Pneumogastric in Effecting Dilatation of the Vessels and Diminishing the Frequency of the Heart.*—MM. CYON and LUDWIG believe that they have established on an experimental and sure basis the very interesting physiological fact, that one of the cardiac branches of the pneumogastric contains fibres which possess the remarkable power of effecting dilatation of the vessels, and of coincidentally diminishing the frequency of the beats of the heart. They propose to call it the *depressor* nerve. A double interest is attached to this, since, if correct, it adds another instance to those already known of inhibitory nervous action, whilst it is opposed to the general proposition laid down by MAREY, that the heart beats more frequently in proportion to the diminution of the resistance offered to the discharge of its contents.

The nerve in question springs, in the rabbit, either from the superior laryngeal alone, or from that nerve and the pneumogastric trunk, applies itself to the carotid artery, and runs down close by, but quite distinct from, the sympathetic nerve. It terminates by uniting with branches of the ganglion stellatum, and forming a plexus between the aorta and pulmonary arteries.

The first experiment made on this little nerve consisted in dividing it, and exciting the lower cut surface tetanically by an interrupted current. The result was *nil*. On applying the same irritation to the upper cut surface it was immediately observed that the pressure of the blood in the vessels began to diminish, ultimately reaching the half, or even one-third of the original amount, and this not only in the carotid, but also in the crural arteries—an effect that was visibly owing to a diminution in the calibre of the aorta. Coincidentally with the diminution of the blood-pressure, the frequency of the beats of the heart was observed to diminish, and this occurred even when a large portion of the trunk of the pneumogastric below the point where the superior laryngeal is given off was excised. The retardation was most remarkable at the commencement of the experiment. If the experiment was prolonged whilst the pressure continued to be diminished, the frequency of the heart's action generally regained its normal standard, showing that there was no direct connection between the two. It was further shown that the depressor nerve did not act by diminishing the *force* of the cardiac beats, and thus leading to a diminution of the pressure in the vessels; since on dividing the pneumogastric, and excising the upper portion of the sympathetic in the dorsal region and the ganglion stellatum, with all its branches, irritation of the centric cut surface of the depressor nerve was still followed by diminished pressure in the vessels. And hence, as all reflex paths by which it might have acted on the heart had been removed, the only explanation that remains is that it acts by diminishing the resistances to the

onward passage of the blood. MM. CYON and LUDWIG at once set to work to determine the correctness of this opinion; and, remembering the influence stated to be exerted on the vessels by the splanchnics, they instituted some experiments on these nerves. They found that section of the splanchnics, effected a marked lowering of the pressure in the vessels, whilst irritation of the peripheric cut extremity was speedily followed by exaltation of the pressure. Irritation of the centric extremity was not followed by any observed result. On thinking over these results, it struck them that the depressor nerve might act reflectorily on the vessels through the splanchnics; and the experiment suggested itself of dividing the splanchnics, when, if their view was correct, irritation of the depressor should be of no effect. Moreover, it was already known that compression of the aorta was followed by exaltation of the pressure; and it was therefore natural to expect that, if compression were made, irritation of the depressor should again be followed by very slight, if any, result. Both experiments turned out as they expected. They therefore believe they have established the fact that the small nervous twig, with the above-mentioned relations, possesses the power of reflectorily diminishing the tone of the vessels, and is to be classed as one of the most striking instances of inhibitory action, other examples of which are found in the influence of the vagus in arresting the action of the heart, of the chorda tympani on the vessels of the glandula submaxillaris, and of the nervi erigentes on the male sexual organs.—*Lancet*, Aug 1, 1868.

2. *Origin of Infusoria*.—Prof. BENNETT, in a lecture "On the Atmospheric Germ Theory and Origin of Infusoria," delivered before the Royal College of Surgeons, Edinburgh, on January 17, 1868, stated the conclusions to which he had been led by observations conducted by him for a number of years. He considers that the infusoria, "vegetable and animal, which we find in organic fluids during fermentation and putrefaction, originate in oleo-albuminous molecules, which are formed in the fluids, and which, floating to the surface, constitute the primordial mucous layer of Burdach, the proligerous pellicle of Pouchet. There, under the influence of certain conditions, such as temperature, light, chemical exchanges, density, and composition of the atmospheric air, and of the fluid, &c., the molecules by their coalescence produce the lower forms of vegetable and animal life." He carefully describes the movements of bacteria and vibrones; and the disputed question as to how these grow in length he has settled by actual observation. On two occasions he saw two isolated bacteria unite together lengthways, so as to form a single moving filament. He points out that the so-called germs, collected by Pasteur from the air by means of gun-cotton, are wholly unlike the great majority of the particles we see in the proligerous pellicle. Moreover, these so-called germs, when they can be detected, are exceedingly few in number, whereas any fragment of the proligerous pellicle is crowded with incalculable numbers of molecules, for which, he contends, Pasteur's germs are wholly inadequate to account. The notion that the molecules of the pellicle multiply by division he considers opposed to the fact that they always appear before the vibrones, and evidently unite to produce these: further, he says, "if the primary molecules on the surface of an infusion possess the property of dividing, they cannot at the same moment possess the property of elongating and forming filaments. The one function is subversive of the other. While, then, a cell or vibrio may possess the property of growth and division, these two functions must be exercised at different periods of time, so that, in reference to the early stage of formation, if the molecules divide, bacteria and vibrios could not be formed. A mass of vibrionic molecules is not a compound organism; it is a mere aggregation of similar simple elements. Each of these in passing through certain phases of development may be arrested, or reach maturity at various periods, so that we frequently see different forms present at one time; but that the same forms and the same stages of growth should exhibit directly opposite functions, is surely not in accordance with physiological knowledge." Therefore his conclusion is that the vibrones and other filaments are evidently formed from the molecules, and not the molecules from the filaments. He has also performed numerous experiments, with a view to determine whether or not it be possible to prevent the development of infusoria in a

fluid by means calculated to destroy germs. These experiments were similar to those performed by Schutze, Schroeder, and Dusch, and others, with this difference, that he in every case used nearly all the agents which have been proposed to destroy germs. These experiments have convinced him, that although means be used sufficient to destroy germs in an infusion and in the air in contact with it, infusoria are developed notwithstanding. In conclusion, he points out that these facts and arguments are hostile to the doctrines "omne vivum ex ovo," "omne cellula e cellula," and lastly directs attention to many circumstances which show that organic forms are first produced, and vital properties are afterwards added to them.—*Edinb. Med. Journ.*, March, 1868.

MATERIA MEDICA, GENERAL THERAPEUTICS, AND PHARMACY.

3. *Bromide and Bi-bromide of Mercury as Therapeutical Agents.*—Dr. PROTHEROE SMITH, in a paper read at the *Brit. Med. Assoc.*, states that he has used the bromide and bi-bromide of mercury for upwards of five years, and had found the bromide valuable as an efficient cholagogue and purgative, promoting absorption of morbid tissue with less constitutional disturbance than from calomel. He cited instances, and called on members of the Association to aid him by their efforts further to investigate the subject and to prove his conclusions.—*Brit. Med. Journ.*, Aug. 8, 1868.

4. *On the Anæsthetics of the Present Day.*—Dr. A. ERNEST SANSOM, in a paper read before the *Brit. Med. Assoc.*, reviewed the anæsthetics now employed with reference to their special advantages in special cases and circumstances. The employment of nitrogen proved that anæsthesia could be induced by the mere deprivation of oxygen. It induced the accumulation of carbonic acid in the blood, so that its administration was really equivalent to the administration of carbonic acid. Nitrous oxide had shown special advantages in cases of dentistry. The author considered that it acted chiefly by filling the lungs with a gas which could not sustain the normal processes of aeration, but he thought that it also had a special action on the blood. He considered that great care should be used in its employment, and it should not be given to any patients suffering from pulmonary, cardiac, or cerebral affections; it should certainly not be employed for any prolonged operation, but to the dental surgeon it was a great boon, inducing a rapid anæsthesia and being followed by an immediate recovery. It should only be trusted in skilled hands, and should then be used with caution. Inasmuch as both these agents induce their effects by the superinduction of an excess of carbonic acid in the blood, he recommended a renewed trial of this anæsthetic, which had been formerly employed with advantage. Briefly alluding to tetrachloride of carbon and bichloride of methylene, the author next turned to chloroform, the great danger of which was the large and unnecessary proportions which were administered. By a very large number of calculations, the author proved that by the common means adopted, atmospheres of from three to ten times the necessary strength were employed. He determined that the best diluent for chloroform is absolute alcohol; and if practitioners would use a mixture of equal parts of chloroform and alcohol, danger would be reduced to a minimum.—*Brit. Med. Journ.*, Aug. 8, 1868.

5. *Anæsthesia and the Mode of Action of Anæsthetics.*—Dr. SANSOM considers that it is particularly important now that much attention be directed to practical anæsthesia, to determine the *rationale* of action of anæsthetics. He criticized the theory of their direct action on the central ganglia of sensation, which he considered disproved by many facts. On the contrary, they presented in their action a complete similarity with the phenomena of deprivation of oxygen. Tracing the action of a typical anæsthetic, the author showed that it

acted both as a cardiac and vaso-motor stimulant: it contracted the systemic arteries, producing a condition of insufficient supply of arterial blood. Dr. Sansom entered into a critical examination of the analogies and correlations of this condition, showing, first, an identity with cold and with galvanism, which by a similar action produced similar results; he traced the effect upon the capillary circulation, showing that the velocity of the latter was diminished, but the blood was expressed towards the venous channels in which it accumulated, hence the distension of the right side of the heart witnessed in *post-mortems*. Chloroform, however, when its vapour is insufficiently diluted with air, has the power of superinducing paralysis of the cardiac and vaso-motor forces—hence its danger. Anæsthetics act on the blood-corpuscle, especially in the hæmoglobin, impeding its oxygenation. The author concluded that anæsthetics produce these phenomena by inducing a suppression of oxidation in the body, 1. directly by acting on the blood; 2. indirectly, by modifying the forces by which the blood is circulated; and that they have no special action on sensory ganglia.—*Proceed. Brit. Med. Assoc., Brit. Med. Journ., Aug. 8, 1868.*

6. *Therapeutical Uses of Bromide of Potassium.*—Dr. J. RUSSEL REYNOLDS, in a paper (*The Practitioner*, July, 1868) on this subject, thus sums up the value of this drug in spasmodic affections: 1. That its efficacy is most marked when the malady is “paroxysmal.” 2. That its value is high in proportion as the disease approximates the type of convulsion known as “epileptic;” and 3, that when spasmodic movements are “habitual,” be they either tonic, or clonic, local, or general, its remedial influence is, at best, extremely doubtful.

In the treatment of certain diseases affecting the cerebral centres in such a manner as to prevent sleep, bromide of potassium has proved of great utility. Here it is necessary to give the drug in such large doses as thirty or forty grains at the ordinary bedtime, and to repeat it frequently in smaller doses, of ten or fifteen grains, during the day.

7. *Action of Bromide of Potassium.*—According to Dr. PLETGER's observations on the human organism, bromide of potassium weakens the energy of the heart's action, and reduces the frequency of its beats, so that the pulse is frequently as low as 50. Large doses of the salt produce somnolency, loss of memory, and mental depression, and in some cases imbecility. These symptoms quickly disappear after suspension of the remedy or a reduction to smaller quantities. The continued administration of large doses causes more or less incapacity for voluntary movements, or a disinclination to perform them. The subject reels and stumbles when walking, whilst in other instances there is muscular debility of the arms without sensations of vertigo and disturbance of equilibrium. The motor nerves seem to be paralyzed through the action of the bromide. The bodily temperature is lowered. The action of the salt upon the digestive organs is manifested by a mild gastric catarrh with a tendency to vomiting, an obstinate constipation after large doses, and redness of the oral and pharyngeal mucous membrane; cough and slight catarrh of the upper air-passages are sometimes produced, and, after doses of from one to two drachms, some dyspnœa. Against abnormal irritability of the genital system the bromide acts with undoubted efficacy; as a remedy for spasm and increased reflex action of the nervous centres, it excels all other means.—*Deutsche Klinik*, No. 10, 1868.

8. *Therapeutical Use of Belladonna.*—In our last No., pp. 258–9, we gave a brief notice of Dr. GEORGE HARLEY's views in regard to the action of belladonna as related in his Gulstonian Lectures. We shall now lay before our readers a more particular account of his conclusions.

“A study of the physiological action of belladonna,” he says, “has led me to regard the plant in a new light as a curative agent. First and foremost, it is a direct and powerful stimulant to the sympathetic nervous system, or, in other words, to the heart. Secondly, it is a potent diuretic. Thirdly, by virtue of its stimulant action on the circulation, it is a means for increasing the oxidiz-

ing processes within the body. Its influence as an anodyne is so fully acknowledged, that I shall omit consideration of this action upon the present occasion.

"First, as a *cardiac stimulant*. It is remarkable that this, the primary and essential operation of belladonna, should have been so long neglected. This plant should stand at the head of all our stimulants; for there is no medicine in the whole materia medica which at all approaches belladonna in its simple, direct, immediate, and powerful influence in exalting the force and rapidity of the heart's action. In all conditions and diseases, therefore, in which there is a depression of the sympathetic nervous influence, such as syncope from asthenia, or shock; in the collapse of cholera; in failure of the heart's action from chloroform or other cardiac paralyzers—the subcutaneous use of sulphate of atropia, in doses varying from the hundredth to the fortieth of a grain, is the appropriate and most hopeful means of resuscitation.

"With a view more of ascertaining the influence of belladonna in progressive failure of the heart's action in inanition, than of hoping for a permanent good result, I injected the two hundred and fortieth of a grain of sulphate of atropia into the arm of an infant ten weeks old, at a time when, excepting a few beats now and then, the pulse was imperceptible at the wrist, and the cardiac systoles only 80. Within four minutes, the pulse rose to 100, and each beat was quite perceptible at the wrist. In eight minutes, it had increased to 110, and was quite regular and distinct. The stimulant continued for the next three hours; and at the end of this time the pulse was 100, of good volume, and of sufficient force to bear compression without obliteration. The respiration remained unaltered, and the pupils dilated from one-twelfth to one-seventh of an inch. The stimulant effect upon the pulse continued to within half an hour of the death of the child, five hours and a half after the injection of the atropia.

"As a *diuretic*, belladonna may be used in cases of *suppression of urine*, whether accompanied by uræmic symptoms or not. As both the sluggish circulation and the torpid kidney are simultaneously aroused by the medicine, there is ground for expecting a restoration of the renal secretion.

"In *acute nephritis*, we may hope for beneficial results from the use of belladonna, which, coming in contact with the irritated and congested organ, will doubtless calm the nervous irritation, and at the same time contract the dilated bloodvessels. I am at the present time busily employed in determining the effects of its operation in congested and inflammatory conditions of the kidney; and, so far as my experience goes, I am led to expect beneficial results in both states.

"In *chronic albuminuria*, belladonna, I believe, will prove very serviceable, provided that the kidney has not passed into the degenerative stage bordering on fatty degeneration. In one case, Charles E., aged 35, who had been under my care for three months for an acute attack of nephritis, commencing with excessive oedema of the legs and exudation of albumen, I administered a single dose of atropia with the following result. On the 10th of January, he had so far improved under the influence of astringent chalybeates and hydragogue purgatives, that there remained but slight pitting of the integuments over the tibia; and the urine, when boiled and heated with nitric acid, gave only a small precipitate of albumen—enough, however, to render the fluid completely opaque from the presence of small flocculi of albumen. At 8.30 P. M., on the day above mentioned, I injected the forty-eighth of a grain of sulphate of atropia beneath the skin; and he passed at that time urine A. The atropia produced full effects; and at 10.30 P. M., when these had passed off, he voided urine B with some difficulty and in small dribblets. Urine A had a specific gravity of 1022.4, and contained exactly a grain of albumen in 1000 grain measures. Urine B was of specific gravity 1024.4, and contained only half the quantity of albumen present in urine A. Four days afterwards, the patient presented himself at the hospital, and reported himself quite well. The oedema of the legs was entirely gone. He passed urine in the prescribing-room; and repeated examination by my clerks and myself showed that the albumen had quite disappeared. The patient has not attended since, from which I infer that he continues well. He had presented himself regularly at the hospital the previous three months, and the urine was regularly examined. The albumen was observed to be slowly diminishing in

quantity, but it had never been absent from the secretion. It appeared, in this case, that the kidneys had received a sudden impulse to healthy action.

"In another case, that of John B., aged 25, who had been under my care for two years continuously for acute, passing into chronic albuminuria, the albumen, which had long been stationary, began to decrease rapidly in amount under the influence of the same treatment.

"The effect of a powerful dose of atropia upon the kidneys in chronic albuminuria is well seen in the analyses above given. It will be observed that there was a decided diminution of the albumen during the operation of the medicine. The result by the operation of belladonna in these cases must be accepted as the best proof of the condition of the bloodvessels generally during that operation. It is quite clear that there is no impediment from contraction of the arteries on the one hand, or from dilatation of the capillaries on the other, to the flow of blood through the kidney. On the contrary, it appears that the vessels of the gland are aroused by the action of the drug into a healthy state of excitement; a condition highly favourable for the nutrition of the organ, and the removal of chronic disease. As a means of promoting oxidation of the blood, belladonna will doubtless prove of essential service in the uric and lactic acid diatheses. I have employed it in rheumatic fever with marked success. I inject the fiftieth or fortieth of a grain of the atropia salt into the integument over the affected joint, as soon as the first indication of inflammatory action arises in the part. The anodyne action is so direct, speedy and enduring, that the use of opium, which, excepting for its anodyne and hypnotic actions, is decidedly objectionable in this disease, is altogether unnecessary. The subcutaneous use of atropia in other acute diseases is a wide field for inquiry, and promises, as far as my observations extend, to be a most interesting and encouraging one."—*Brit. Med. Journ.*, April 4, 1868.

9. *Combined Operation of Belladonna and Opium.*—Dr. GEO. HARLEY, in his *Gulstonian Lectures*, remarks, "There are a number of persons who accept the general statement, deduced from a number of observations, the majority of which are very loosely reported, that belladonna is antagonistic to opium, and *vice versa*; and they would not hesitate in a case of poisoning by either of these drugs to give at once an equally poisonous dose of the other as an antidote. I have no time at present to criticize the cases from which such conclusions have been derived; but, feeling that the whole question required most patient and careful examination, I have devoted much time during the past year to its elucidation.

Dr. H. then related the effects of opium and belladonna separately and combined on the horse and dog, and draws the conclusion from these experiments that in the animals mentioned opium and belladonna intensify each other's action.

"In turning now," he remarked, "to the consideration of the combined operation of opium and belladonna in man, I must first concede that belladonna possesses an antagonistic influence to some of the earlier effects of the operation of opium. The first effect of opium, in many animals as well as in many of the human kind, is a derangement of the vagus nerve, resulting in nausea and retching, faintness, and depression of the heart's action. The dog invariably vomits within five minutes of the subcutaneous use of morphia; and, in my own practice, I have had four or five patients in whom the subcutaneous use of seven drops of laudanum, or of one-twelfth of a grain of acetate of morphia, has produced faintness, nausea, ending in vomiting and retching, with intervals of delirious somnolency for eight or nine hours. By repeated experiments upon these individuals, I have found that the previous or simultaneous use of a small dose (one-ninety-sixth of a grain) of sulphate of atropia entirely prevents these distressing and often alarming symptoms; and I have even arrested them after they have been fully developed by the subsequent use of the atropia. It is by virtue of its powerful stimulant effect upon the sympathetic nervous system, that the derangement of the vagus nerve, causing the above mentioned symptoms, is overpowered. This is a most important fact; for, by the help of atropia, we may, I believe, bring *all* individuals alike under the beneficial influence of opium. The only question of antagonism that now remains, is that which might be sup-

posed to result from this same stimulant effect of belladonna upon the heart; and it may be asked, 'Would not this action alone be sufficient to arouse a patient in whom the pulse and respiration were well nigh obliterated by the effect of opium?'

"I answer, inasmuch as belladonna has no stimulant action upon the vagus nerve, and therefore no influence upon respiration, no other result can be expected from the operation of belladonna, in a case of poisoning by opium, than that which would follow its administration in any other similar case of depression of the cardiac and respiratory functions. It will doubtless arouse the heart, but there is little hope of increasing the breathing; while, on the other hand, the atropia, if given in a large dose, will only deepen the stupor. As a cardiac stimulant, the dose should never exceed the ninety-sixth of a grain, repeated at an interval of an hour and a half or two hours.

"With these preliminary remarks I come now to consider the combined operation of opium and belladonna upon man; and I may say, generally, that it is precisely such as I have already described as occurring in the dog. The following experiments, which are in strict accordance with a great number of similar ones made upon almost every variety of constitution, will, I think, when taken with the foregoing experiments upon the horse and dog, conclusively prove that in man also opium and belladonna have not the antagonistic action which has been attributed to them.

"1. Samuel M., aged 49, pulse 75, pupils one-ninth, tongue moist. I injected one-quarter of a grain of acetate of morphia into the arm. In one hour, the pulse was accelerated two beats, its volume and power unchanged; pupils one-tenth. In two hours, pulse was decreased nine beats, slightly diminished in volume; pupils one-twelfth. The dose produced a sleepy, tranquillizing effect, but he did not sleep nor require to make any effort to keep himself awake; the mouth remained moist throughout.

"2. Some days afterwards, I injected the one-forty-eighth of a grain of atropia. In ten minutes, the pulse was accelerated 45 beats, the pupils slightly dilated, the tongue dry at the tip. In 30 minutes, pulse as last mentioned, pupils one-fourth, tongue dry and brown, hard and soft palates dry and glazed. In one hour, the pulse was accelerated 32 beats; he felt a little dozy; the mouth and pupils were as at 30 minutes. In an hour and 40 minutes, the pulse was accelerated 17 beats; the dryness of the tongue was reduced to a narrow streak; pupils as before.

"3. On a third occasion, I injected one-fourth of a grain of acetate of morphia one hour after the injection of the forty-eighth of a grain of sulphate of atropia; when the pulse was accelerated 25 beats, and the pupils dilated to one-sixth; the tongue and palate completely dry. Fifteen minutes after the injection of the morphia, the pulse was accelerated 35 beats; mouth and pupils unchanged; he felt very sleepy. An hour afterwards, the acceleration of the pulse was still 35 beats; pupils one-sixth; the mouth, which had continued parched up to the present time, was moistening; but the back of the tongue and throat were dry and parched. He continued sleeping. In an hour and three-quarters after the injection of the morphia, the pulse was accelerated 30 beats; pupils rather more than one-sixth; mouth moist. He continued sleeping. The effect was charming. He fell off to sleep fifteen minutes after the morphia, and continued to sleep soundly and continuously, breathing 16 tranquilly, by my side, and opposite a bright gas-lamp, for two hours, when I completely aroused him. It is to be observed, on the one hand, that the opium prolonged the belladonna effects very considerably, while it failed to prevent dilatation of the pupil; and, on the other hand, that the atropia greatly increased the narcotic effects of the opium.

"4. On another occasion, I reversed the former experiment on the same individual; and, an hour after the operation of the fourth of a grain of acetate of morphia, when the pulse was accelerated 5 beats; the pupils one-twelfth; respirations 15; the tongue moist and clean; and he was feeling sleepy, but not so much so as to sleep, I injected the forty-eighth of a grain of sulphate of atropia. In twelve minutes, the pulse was accelerated 42 beats, and increased in power; pupils dilated to one-tenth; respirations 14. 'He felt heavier for sleep.' In thirty minutes, the pulse was accelerated 50 beats; pupils nearly one-seventh;

the anterior half of the tongue and the whole of the hard and soft palates were completely dry; the latter glazed. He was sleeping. In one hour, the pulse was accelerated 40 beats; pupils one-seventh; tongue dry and brown; respirations 12, regular; cheeks and forehead slightly suffused, and warmer; sclerotic a little injected. He was sleeping. In an hour and a half, no change in pulse or mouth; pupils a little larger; respirations 14. He was very sleepy and giddy still, and walked very cautiously. The drowsy feeling, which existed before the injection of the atropia, increased fifteen minutes after the injection of the latter to an inability to keep awake; and he continued to sleep soundly by my side, in front of a bright gas-lamp, for more than an hour, when I was obliged to leave him. He reported that, compared with former injections, he slept unusually soundly the night following this injection; and he voluntarily remarked, that the combined doses had a much more powerful hypnotic effect than the morphia alone. It will further be observed, that the previous operation of the morphia predisposed the system to the influence of atropia, since the effects of this latter were also in this case intensified and prolonged, as will be seen on reverting to Experiment 11.

"Opium does not prevent nor retard, so far as I have been able to determine, the elimination of atropia from the system."—*Brit. Med. Journ.*, April 11, 1868.

10. *Physiological Action and Therapeutical Use of Hyoscyamus, alone and in Combination with Opium.*—Dr. GEO. HARLEY states (*Gulstonian Lectures*), that "Hyoscyamus, or its active principle, when given in small doses, and such as are insufficient to produce positive dryness of the mouth, rapidly subdues ordinary excitement of the pulse, and reduces it, within an hour or two, to its slowest rate; that is to say, to that condition in which it may occasionally be found after a long period of complete rest of mind and body. For example, the pulse of a man ordinarily engaged shall be 80. After a small dose of hyoscyamus (one-fortieth of a grain of sulphate of hyoscyamia, or four drachms of tincture of henbane), it will gradually fall to 60 or 50. In another person, whose pulse may be 72, we shall at the end of the same time find it steadily beating about 45. Schroff states that the three-hundred-and-thirty-third of a grain of hyoscyamine reduces the pulse from 79 to 18. In all my experiments with hyoscyamus and its active principle, I have never observed the pulse to fall lower than 42.

"After doses (one-sixteenth to one-twelfth of a grain) sufficient to produce complete dryness of the tongue and hard and soft palates, the pulse will generally experience an acceleration of ten or twenty beats, and be increased slightly in force and volume. This change in the pulse will be observed in from ten to twenty minutes after the subcutaneous injection of hyoscyamine; the acceleration does not usually continue for longer than twenty or thirty minutes, and rarely lasts for an hour. Then the pulse slowly declines, and gains a little in force and volume. It usually decreases about five beats for every interval of twenty or thirty minutes, until, at the end of from an hour and a half to two hours, it attains its minimum rate. Apart from these accelerating or depressing effects upon the pulse, the following symptoms will be observed after moderate doses (one-thirtieth to one-twenty-fourth of a grain). In ten to twenty minutes from the time of injection, the tongue more or less completely dry, rough, and brown, the hard and soft palates dry and glazed, excessive giddiness, and a weight across the forehead, somnolency, the cheeks occasionally a little flushed, and the membranes of the eye sometimes slightly injected. After continuing for about an hour, these symptoms pass off; and the tongue and hard and soft palates become covered over with a sticky, acid, offensive secretion, agreeing in all respects with that observed after the action of belladonna. The pupils slowly dilate during the latter part of the action of the medicine, and at its close attain their maximum degree of dilatation.

"If larger doses than one-twelfth of a grain be given, the above mentioned effects will be increased in degree, and prolonged for two or three hours; and they will be accompanied either by wakeful, quiet, and usually pleasing delirium, with illusions of the sight; or with such excessive somnolency that the patient cannot keep the eyelids raised for a few seconds, but, when aroused, lapses

again into a dreamy sleep, broken by occasional mutterings and slight jerking of the limbs. In either case, the power of maintaining the erect posture will be lost, and at best the patient reels like a drunken man.

"When taken by the mouth, hyoscyamus, or its active principle, produces exactly the same effects. They are fully developed about an hour after the ingestion of the medicine.

"Three ounces of a succus hyoscyami, prepared for me, produced effects equal in degree and duration to one-eighth of a grain of the sulphate of hyoscyamia¹ used subcutaneously. A fluidounce of this succus, or of the common tincture, or fifteen grains of good extract, are about equivalent to the fortieth of a grain of the sulphate introduced by the skin.

"Children will usually bear a very large quantity of henbane. I have frequently given a fluidounce of the succus, or tincture, to children under twelve years old, with no other effects than an acceleration of the pulse thirty or forty beats, continuing for an hour and then gradually declining; and, towards the end of the action, a moderate dilatation of the pupil. The mouth has remained clean and wet throughout; and there has been no trace of giddiness or sleepiness." * * * * *

"In its action upon the system, hyoscyamus appears to be intermediate between opium and belladonna, possessing as it does, on the one hand, powerful somniferous properties second only to opium itself, and, on the other, an influence upon the sympathetic nervous system, as indicated by the pulse, secondary only when given in larger doses, to that possessed by belladonna itself.

"Compared with belladonna, it is distinguished by a preponderance of deliriant or somniferous properties. Compared with opium, it agrees, on the one hand, very closely with that drug in its cerebral effects, provided we take a wide view of the operation of both medicines upon the system; while, on the other, its influence upon the pulse, upon the mucous membrane of the mouth, and upon the pupil, place it in strong contrast with that drug. In addition to its cerebral and sympathetic effects, henbane has a powerful depressant influence upon the motor function, and thus comes into relationship with conium.

"I have referred the chief effects of belladonna to its stimulant action upon the sympathetic nervous system; and it cannot be doubted, I think, that the more obvious effects of hyoscyamus arise from the same cause; but the stimulant effect of hyoscyamus is, comparatively speaking, of so short a duration, that this action, as indicated by the condition of the urinary secretion, is not very manifest.

"Hyoscyamine, however, like atropia, is eliminated by the kidneys. It may be detected in the urine at any time during the operation of the medicine. I have demonstrated its existence in the urine twenty-two minutes after the injection of one-fifteenth of a grain of hyoscyamine into the skin, and two hours and a half after two ounces of the succus hyoscyami were taken into the stomach. Further, it may readily be isolated from the urine, and identified and distinguished from atropia. The urinary constituents themselves do not appear to undergo any diminution nor increase during the operation of hyoscyamus." * *

"The fact of the passage of hyoscyamine and atropia, in an undecomposed state, through the urinary tract in their passage out of the system, leads me to the consideration of the influence of these medicines upon the bladder and kidney itself. At the end of the operation of belladonna or hyoscyamus, many individuals altogether fail to pass a single drop of urine, and this retention is often prolonged for several hours; but never, when the bladder is in a healthy condition, causing any inconvenience. Sometimes, after prolonged efforts, the patient is able to eject a little urine, a few drops at a time. On three occasions, in adult males, I have been obliged to remove the urine, for the purpose of examination, by means of the catheter; in each case, the No. 11 instrument passed with the utmost facility, and, on withdrawing the stylet, the urine flowed in a sluggish, powerless stream, and there was little or no indication of any contrac-

¹ The sulphate of hyoscyamia used in these investigations was prepared by the lecturer from the seeds of the biennial plant. It was of a light-brown colour, semi-crystalline, and highly deliquescent.

tile power behind it. It is plain, therefore, that the proper sensibility of the mucous surface of the bladder was blunted by the contact of the atropia or hyoscyamine, and thus the natural stimulus to contraction was removed.

"From these facts, we can readily understand the beneficial influence of these medicines upon that irritable condition which keeps the bladder in a constant state of contraction. In all irritable conditions of the kidney, and especially in the oxalic and uric acid diatheses, henbane is invaluable." * * *

"The combined action of hyoscyamus and opium presents some interesting features. Briefly, they are as follows: 1. Opium prolongs and intensifies the effects of hyoscyamus, even to producing an acceleration of the pulse some 15 or 20 beats for an hour or more. 2. Hyoscyamus increases the hypnotic action of opium, and to a certain extent is able to prevent the derangement of the vagus nerve, which is frequently the first effect of opium. 3. Opium, given in combination with hyoscyamus, does not prevent the elimination of hyoscyamia by the kidneys."—*Brit. Med. Journ.*, April 11, 1868.

11. *Hypodermic Injection of Remedies*.—Dr. ANSTIE (*The Practitioner*, July, 1868) claims the following advantages for the hypodermic over the gastric administration of drugs: 1. Economy of the drug. 2. Entire abolition of the depressing or irritant effects which are locally produced in the alimentary canal during the *digestion* of various remedies. 3. Far greater *permanence of effect*, in many cases, than can be produced by medicine swallowed. 4. Much greater rapidity of action. One most important conclusion from these facts is this: *that anodynes and hypnotics ought never to be administered by the mouth in acute disease attended with anorexia*. Regular and systematic nutrition is the great necessity and the great difficulty in those diseases, and the avoidance of any treatment tending to interfere with digestion of simple food is a cardinal duty.

As to the question of *danger* of this method, he says, that there is *absolutely none* if the injector will remember two cautions—first, that the physiological activity of nearly every substance which can be thus used is *three if not four times greater when it is given by the skin than when it is swallowed*; and secondly, that the liquid injected must not be either markedly acid nor markedly alkaline, nor in any way obviously *irritant to tissue*.

Morphia, Dr. Anstie says, should be used in the form of the acetate, dissolved with a minimum of acetic acid in hot distilled water five grains to the drachm. One minim of this will represent one-twelfth of a grain, a very useful minimum dose in cases of slight neuralgic pain. Two minims ($\frac{1}{6}$ grain) is the best commencing dose for the relief of severe pain, and as a hypnotic in states of nervous irritability. Three minims (or $\frac{1}{4}$ grain) is an *unsafe dose to commence with*; dangerous and even fatal results have been known to follow its use.

The salt used in this manner is at least three times as powerful for every therapeutic purpose as when swallowed, and the majority of the unpleasant symptoms which opiates, when given by the mouth can produce, are entirely absent when administered hypodermically. The fact seems to be, that in the gastric digestion of morphia much of the salt becomes decomposed, and its specific effect on the blood is lost; but during the digestive process it acts depressingly upon the gastric nerves, and *pro tanto* disorders the functions of the stomach.

Atropia is an extremely valuable hypodermic agent for the relief of local pain and spasm. It should be employed in the form of solution of the sulphate; four minims containing $\frac{1}{60}$ grain; two minims will be the proper commencing dose in adults, unless the pain to be relieved is very severe. It should be cautiously increased to $\frac{1}{30}$ or $\frac{1}{15}$ grain; more can seldom be needed, and poisonous effects may be produced if pushed to higher doses. Atropia is incomparably the best of all medicinal remedies for every kind of pain in the pelvic viscera. Nothing can approach it in this respect.

Strychnia, Dr. Anstie has found to be a most valuable remedy in gastralgia. It should be administered in solution, two grains to the ounce of distilled water, and the proper commencing dose is two minims ($\frac{1}{120}$ grain).

MEDICAL PATHOLOGY, SPECIAL THERAPEUTICS, AND PRACTICE OF MEDICINE.

12. *Nature and Treatment of Pulmonary Consumption as Exemplified in Private Practice.*—This is the title of a paper continued through several recent Nos. of the *Lancet*, by Dr. C. J. B. WILLIAMS, who is high authority on this subject, and his son. In his concluding article (Aug. 15, 1868), Dr. W. says that, on taking a retrospect of an experience of forty years in the treatment of consumption, he can trace a remarkable improvement in its success as judged by its results. He ascribes this improvement to the use of cod-liver oil, and expresses his conviction that this agent has done more for the consumptive than all other means put together. "And so far," he says, "is this remedy from having 'had its day and gone out of fashion,' that in my experience its usefulness and efficacy have gone on increasing in proportion to the greater facilities for obtaining it in a pure state, and to the improvements in the manner of administering it, in combination with various tonics, and in connection with certain rules of diet and regimen."

Dr. W. states that the average duration of life in phthisis during his forty years' experience has at least quadrupled, or raised from two to eight years, and that "this is below the actual results as calculated by my son; for of the 500 cases, 380 were still living at the last report, and many of these are likely to live for many years to come."

The treatment which Dr. W. has commonly adopted, is as follows:—

"As we have been led to conclude that consumption is essentially a disease of degeneration and decay, so it may be inferred that the treatment for the most part should be of a sustaining and invigorating character. Not only the most nutritious food, aided by a judicious use of stimulants and of medicinal tonics, but pure air, with such varied and moderate exercise in it as the strength will bear, and the enlivening influence of bright sunshine and agreeable scenery and cheerful society, are among the means best suited to restore the defective functions and structures of frames prone to decay." * * *

It is generally considered that consumption should be treated on a tonic and sustaining plan; and that the nourishment and strength of the system should be supported by varied tonics and cod-liver oil, as well as by the most nutritive articles of diet. But, Dr. W. says, "when the disease is ushered in with symptoms of acute bronchitis or pneumonia, with its attendant fever and scanty disordered secretions, it is obvious that such treatment is wholly unsuited for the occasion; and that remedies of the mild antiphlogistic kind, such as salines, with or without antimony, blisters, and cataplasms, and sometimes even moderate leeching or cupping, will give most relief, and will prepare the patient for the safe administration of the sustaining class of remedies." * * In case of active inflammation, continued heat of skin, hard racking cough (dry, or with viscid and tinged expectoration), much pain or soreness of the chest or side, it answers well to withhold or withdraw the stronger stimulants and tonics, and for a time—it may be a few days only—to substitute cooling and soothing remedies, with moist epithems or counter-irritants on the chest, and, more rarely, local depletion. But this discipline, which is exceptional, should as soon as possible be replaced by what may be called the regular treatment by cod-liver oil and tonics, and a more generous diet. The transition need not be abrupt. So far as regards cod-liver oil, and the mild acid tonics, with which I generally combine it, the change may be made long before the inflammatory complication has subsided. A dose of these may be given after the morning and perhaps after the mid-day meal, whilst still the saline is taken in the evening and night, and whilst blisters or other counter-irritants are in full operation.

"So soon as the nocturnal heat of skin subsides and the cough becomes less urgent, and the urine more free, the salines may be replaced by a mere cough linctus, if that be needed; the counter-irritation moderated, and the tonic, given with the oil, gradually strengthened by the addition of small doses of salicine, quinia, or iron. These two last tonics are of great use where they are well

borne, as their influence in strengthening the muscular system and in improving the condition of the blood is greater than that of any other drug; but their use requires much discretion and watchfulness, for they often increase the lingering or intercurrent inflammations, with their attendant pain, constriction, cough, and viscid expectoration, and not unfrequently they derange the functions of the stomach and bowels. It, therefore, often happens, where the patient cannot be seen frequently, that it is safer to be content with a milder tonic—such as calumba, cascarilla, or chiretta—which may be continued for weeks and months together in conjunction with the oil, than to give those that are more powerful, but which by occasional disturbances may prevent the continuance of the remedy.

“But the great remedy, more essential and more effectual than any other, is the cod-liver oil; and we may well bestow a little consideration on the mode of using it to the best advantage. It is now pretty generally admitted by the profession that the pure, pale oil, simply extracted from the fresh, healthy livers of the fish, is that most suitable for the majority of patients, as being less unpalatable and at least as efficacious as the impure kind.” * * *

“Cod-liver oil, when taken into the system in sufficient quantities, and for a sufficient length of time, acts as a nutrient, not only adding to the fat of the body, but also promoting the healthy growth of other tissues, and in some way, as an alternative, counteracting the morbid tendency to the proliferation of the decaying cells of pus, tubercle, and kindred cacoplastic and aplastic matters.

“That its efficacy depends much on its being absorbed freely into the blood, and through the circulation pervading all parts of the body, and thus reaching to the very seat of morbid deposits and formations. That the more fluid part of cod-liver oil surpasses all other oils and fats in the facility with which it forms emulsions, which are tolerated by the stomach and readily absorbed into the blood, without causing the nausea and bilious derangement that commonly result from an excess of fat food. This peculiarity may depend on the biliary and other matters contained in the oil, which in other instances of disease is found to act beneficially on the liver and other secreting organs.

“That the best time for the administration of the oil is immediately after, or, to those who prefer it, at or before, a solid meal, with the constituents of which the oil becomes so intimately blended that it forms a part of the chymous mass, and is less likely to rise by eructation than when the oil is taken into an empty stomach. From this chymous mass, the oil being absorbed through the lacteals with the chyle, is less apt to disorder the liver than if absorbed through the veins of an empty stomach.

“That as the use of the oil should be continued for a long time—perhaps for months, or even years—it is of great importance to conciliate both the palate and the stomach by giving it in a vehicle which may agreeably disguise its flavour and strengthen the stomach to bear it. For this purpose an aromatic bitter, such as the compound infusion of orange-peel, acidulated with a mineral acid, both to help to cover the taste of the oil and also to suit the stomach, which should be duly supplied with acid during digestion, generally answers well. Syrup may be added according to the taste of the patient; or, still better, some bitter tincture, such as calumba, cascarilla, or quinia, in every case in which it is desirable to improve appetite and tone. In cases of peculiar weakness of stomach, with tendency to retching or nausea, strychnia, in a dose of from $\frac{3}{8}$ to $\frac{1}{4}$ of a grain, proves a most valuable adjunct to the vehicle. By its means I frequently overcome the fastidiousness of stomach arising from debility, hysteria, or indulgence in alcoholic liquors. Salicine is another efficacious alternative of the same kind. Either of these, although a powerful tonic, has none of the heating properties of quinia or iron. When the strong bitter taste is objected to, a pill, containing extract of hop or chamomile, or salicine, or quinia, may be taken after, or before, the oil and its vehicle.

“The bulk of the whole dose of oil and vehicle should be small, so that it may be swallowed at a single draught; therefore the vehicle should not exceed a tablespoonful, with, at first, a teaspoonful of oil, to be gradually increased to a tablespoonful. The dose of oil should rarely exceed a tablespoonful twice or thrice daily: when a larger amount is taken at a time, generally either it deranges the stomach or liver, or some of it passes unabsorbed by the bowels.

"The acid may be varied according to circumstances. The nitric generally suits best in inflammatory cases, and those attended with much lithic deposit in the urine; but its tendency to injure the teeth is an objection to its long continuance. The sulphuric is more eligible where there is liability to hæmoptysis, profuse sweats, or diarrhœa. But in most cases, and for long continuance, I have found reason to prefer the diluted phosphoric acid, which may be termed the most physiological of the acids, tending to derange the chemistry of the body less than the others.

"With some individuals the oil agrees so well, and so much improves their digestive powers, that they require few or no restrictions in diet; but this is not the case with the majority. The richness of the oil does prove more or less a trial, sooner or later, to most persons; and to diminish this trial as much as possible, it obviously becomes proper to omit or reduce all other rich and greasy articles of food. All pastry, fat meat, rich stuffing, and the like, should be avoided; and great moderation observed in the use of butter, cream, and very sweet things. Even new milk in any quantity is not generally borne well during a course of oil; and many find malt liquor too heavy, increasing the tendency to bilious attacks. A plain nutritious diet of bread, fresh meat, poultry, game, with a fair proportion of vegetables, and a little fruit, and only a moderate quantity of liquid at the earlier meals, commonly agrees best, and facilitates the continued exhibition of the oil in doses sufficient to produce its salutary influence on the system.

"In case of a bilious attack coming on, indicated by nausea, headache, furred tongue, offensive eructations, high-coloured urine, and sometimes pain and tenderness of the right hypochondrium, it is necessary to suspend the oil, lighten the diet of the patient, and give blue pill or calomel with an aperient on alternate nights, and an effervescent saline two or three times during the day. A few days of this treatment will generally set the stomach and liver to rights, and the oil may be resumed, beginning with small doses as at first. In all cases during the use of the oil the bowels should be kept regular in action; and if this cannot be done by regularity of habit and diet, it should be effected by the use of a mild daily pill of rhubarb or aloes." * * * *

"Although my long experience assigns to cod-liver oil a place far above all other remedies in the treatment of pulmonary consumption and its allied maladies, it has taught me to believe also in the limited efficacy of certain other agents, and it would not be fair to pass these over in this brief summary of treatment.

A combination of iodide of potassium and nitric acid with a vegetable tonic, Dr. W. says, has distinctly wrought some good in consumptive cases before the pure oil was introduced. He still sometimes uses this medicine in the rare cases in which cod-liver oil disagrees or cannot be taken, and thinks that it is improved by the addition of a drachm or two of pure glycerine to each dose. Glycerine by itself is of little use, but it is valuable as a lubricant, and to sheathe the acrimony of mineral acids and other pungent medicines.

"The hypophosphites of soda and lime, so strongly recommended by Dr. Churchill, of Paris, have in my hands proved decidedly beneficial in certain cases. They have been tried by Drs. Quain and Cotton, at the Brompton Hospital, with only negative results; but having met with several patients who distinctly ascribed their improvement to Dr. Churchill's treatment, I have thought it right to try them myself, both as a substitute for the oil and in addition to it. In the former way the results have not been generally satisfactory: the hypophosphite does not disagree, but there is no marked improvement as under the oil; and when they have been doing well under the oil, the patients generally lose flesh and strength when the hypophosphite is substituted for it. On the other hand, it has happened to me in several cases that a patient has long been taking the oil, and, after having derived great benefit from it, halts in his improvement, or even loses ground, and then the addition of the hypophosphite has been followed by a marked change for the better; flesh and strength have been gained, and the chest symptoms have been more or less improved. In these cases I have merely added four or five grains of the hypophosphite to the vehicle in which the oil is given, always selecting the phosphoric as the acid,

and generally substituting glycerine for the usual syrup. Such precautions are necessary, because the hypophosphites are very unstable in composition; the addition of nitric acid, or mere exposure of the solution to the air (if not guarded with glycerine or a good deal of syrup), being sufficient to convert them into inert phosphates. In my mixture of the hypophosphite with phosphoric acid, I presume the hypophosphorous acid is set free, and is the active agent in the compound. How it acts is quite uncertain. * * *

"Perhaps the efficacy of the sulphurous acid—Dr. Dewar's remedy for consumption—may depend on an influence not altogether unlike that of the hypophosphites. My experience of the use of the spray of sulphurous acid is limited in phthisis, and as far as it has gone has not been very encouraging. But I have found the spray a most useful and agreeable remedy in various affections of the throat, whether diphtheritic or aphthous; and it has proved cleansing and soothing in some cases of foul ulceration of the throat, affecting both larynx and fauces, generally syphilitic in origin, and sometimes ending in pulmonary consumption.

"In connection with this subject, I most notice remedies administered by inhalation, which are really useful in certain cases, chiefly those in which the larynx and trachea are much affected, and in those attended with convulsive cough or offensive expectoration. I have generally found the use of inhaling instruments fatiguing and unnecessary. A quart jug of hot water, with a napkin from over the nose down to and around the jug to confine the steam, is all that is needed. To the hot water is added the drug to be inhaled; and creasote or carbolic acid, iodine, chloroform, oil of turpentine, and juice or extract of hemlock, are the articles which I have found most beneficial. A few drops of one, or of several of these combined, being put into the hot water, the inhalation is practised through both mouth and nostrils without restraint or difficulty, and may be continued for five or ten minutes every night, and, if need be, repeated once or twice in the day. Although the chief operation of this medicated vapour is on the guttural and bronchial surface, yet a portion penetrates into the lungs, and is absorbed into the system; for iodine and oil of turpentine can be detected in the urine within a few minutes of the inhalation being made. Still, although proving very serviceable in certain cases, I cannot rank inhalation higher than as a subordinate remedy in the treatment of consumption. I may add, that the practice of painting the chest with tincture of iodine every night, as a gentle counter-irritant, is not without a certain influence in the way of inhalation; for a portion of the iodine evaporates, and slightly impregnates the air around the patient, and this atmosphere of iodine may not be without its influence for good." * * *

"Of far more importance in the treatment of consumption is change of air and climate. It is of the greatest consequence to the phthisical invalid that he should breathe as pure an air as possible, and that the influence of this pure air on the blood and on the body should be increased by such gentle and varied exercise in it as his strength and the condition of his organs will permit. This is the great object of our sending him to a warm climate in winter, and to a high and dry locality in the summer, that he may be as much as possible in the *open air*, with its exhilarating and vivifying accessories of light, purity, and freshness, without the chilling operation of cold and wet in the winter, and the enervating and exhausting influence of oppressive heat in the summer." * *

In conclusion, Dr. W. states "that, powerless as medicine is in the overwhelming and rapid types of pulmonary consumption, it has yet considerable influence over the milder forms; and that *under careful treatment life may be prolonged for many years in comfort and usefulness, and in not very few cases the disease is so permanently arrested that it may be called CURED.*"

13. *Use of Ether and Etherized Cod-liver Oil in the Treatment of Phthisis.*—Dr. B. W. FOSTER, in a paper read before the British Medical Association, at its recent meeting, referred to the great difficulty of digesting fatty food which distinguished the great majority of phthisical patients and stated that this defective assimilating power has hitherto been treated by incorrect or insufficient means. The only true method of treatment, he thinks, to be adopted in

such cases, should be directed to the organs whose secretions are at fault. Physiology teaches that the digestion of fat is specially performed by the secretion of the pancreas and the glands of small intestine. Dr. Foster had long sought for a means of influencing these glands, and at last had found most ample evidence in the works of Claude Bernard, that ether is capable of augmenting the pancreatic secretions to almost any degree. Bernard was accustomed, in his experiments, to give ether to animals, in order to obtain a good flow of pancreatic juice. Applying this discovery to the treatment of phthisis, Dr. Foster had met with most satisfactory results. The ether was given as a mixture sometimes, but generally in the form of etherized cod-liver oil. Of the patients treated, and all observed over some months, some over two years, 42 per cent. improved under treatment, 30 per cent. remained stationary, and only 28 per cent. became worse; 12 per cent. of the cases treated presented all the evidence of the arrest of the disease. In no case were the symptoms and physical signs alone accepted as evidence of improvement, every case was weighed from week to week while under observation, and only a decided increase of weight in addition to other signs received as evidence.—*British Medical Journal*, Aug. 8, 1868.

14. *Etiology of Phthisis*.—Dr. P. EADE, of Norwich, in a paper read before the British Medical Association, endeavoured to show that tubercle was essentially but an expression of feeble vitality and exhausted nerve-power, permitting the occurrence of an ill-regulated or unrestrained cell-growth or development. Cells (he said), more or less simple, were the original and lowest form in which animal life was presented. Higher animal structures were formed of such cells elaborated under the influence of more highly developed nervous centres. Any defect of these centres would tend to allow the body to be formed of less highly organized and vitalized tissues with a constant tendency to revert to their original form of cells. The subjects of congenital tuberculosis were feebly and flabbily formed, and their tissues had a constant tendency to disintegrate (prone to ulceration), and to develop new cell-structures (in lymphatic glands and as purulent discharges). The actual invasion of disease in tuberculously cachectic individuals was due to exhaustion of the nerve-force of the part affected. In acquired tuberculosis (which was chiefly of the lungs) a similar exhaustion of the peripheral nervous twigs was produced, either directly or more commonly by a reflex action from the surface. The part was thus at once reduced to a lower condition of life, and cell growth was allowed to begin, either in spots as miliary tubercle, or in parts as tubercular consolidations. The cells were of feeble vitality, and hence tended rapidly to degenerate. They were possibly capable of reproduction. A close affinity existed between the cause of inflammation and tuberculization of the lungs, the difference being that in the one case the effect produced was sudden or extensive and the patient healthy; in the other the effect was produced more slowly and the patient was congenitally cachectic or temporarily lowered in nervous tone.—*British Medical Journal*, Aug. 8, 1868.

15. *Thermometry of Enteric Fever*.—The number of the *Edinburgh Medical Journal* for August last contains an interesting paper on this subject by Dr. T. J. MACLAGAN. He states that the chief feature in the thermometry of this disease, as has already been observed, is the tendency which the temperature shows to fall in the morning and rise in the evening. This characteristic is more marked at some stages of the disease than at others; but, in cases tending to a favourable termination, is never altogether wanting, and at the commencement of defervescence becomes so exaggerated as to be quite a distinguishing feature of the disease.

To illustrate this characteristic range as well as its practical utility in diagnosis, prognosis, and treatment, he relates six cases.

The following is a brief summary of the facts he has observed:—

“1. The main feature in the thermometry of a typical case of enteric fever is a marked tendency to a morning fall and evening rise, which during defervescence is so great as to be characteristic of the disease.

“2. The temperature during the continuance of the febrile state, however, does not enable us to distinguish enteric from other forms of fever.

"3. In cases resembling, and apt to be mistaken for, typhus, the evidence given by the thermometer is uncertain and not equal in value to that got from other sources, especially the condition of the eyes.

"4. In cases which throughout have been doubtful, it often gives during defervescence the only certain testimony as to the nature of the malady.

"5. When head-symptoms are severe, and death is threatened by coma, the range of the temperature is generally high and irregular; but the more rapid onset of the head-symptoms in such cases does not permit of the thermometer giving the same premonitory indications which it often gives in typhus.

"6. Irregularities in the range, absence of the morning fall, and still more a morning temperature which exceeds that of the evening, are indications of severity, and specially so when the range is at the same time high.

"7. A fall of the morning temperature at the end of the 2d week, and a subsequent range during the 3d, lower than that which existed during the 2d, are favourable signs.

"8. The highest range occurs in cases which present marked head-symptoms.

"9. Inflammatory affections springing up during the course of the disease have an elevating tendency.

"10. Hemorrhages and diarrhoea have, when profuse, a lowering tendency.

"11. A fall of the morning range is generally the first sign of commencing defervescence.

"12. Elevation of the temperature is one of the earliest indications of a relapse."

16. *Typhoid Cutaneous Spots*.—ZULCHAU (Berliner Klin. Wochenschr., 1868, No. 12) describes the occurrence, in conjunction with an unusually copious roseolar eruption, of another one of a yellowish-brown colour of the size of a two-dollar piece and over. The latter spots run into one another. They occur very early, soon after the first chill. They were only observed in very severe cases, which in the first, or in the commencement of the second seven days' period, terminate in death.—*Centralblatt f. d. Medicinisc. Wissenschaft.*, 1868, No. 24. D. F. C.

17. *Pathology and Treatment of Sunstroke*.—DR. GEO. JOHNSON considers that this affection might be more correctly designated as *heat-apnoea*, and he offers (*Brit. Med. Journ.*, Aug. 1, 1868) the following physiological explanation why the super-heating of the blood which precedes and accompanies this disease has a depressing, and not a stimulating, effect on the nervous centres.

"The hot blood relaxes the muscular walls of the minute pulmonary arteries. The pulmonary capillaries are consequently flooded with blood. This overfulness of the capillaries interferes with the aëration of the blood. In fact, the overgorged vessels must encroach upon the pulmonary vesicles, and so diminish the air-space within the lungs, while the air itself is highly rarefied. Hence a state of more or less complete apnoea. Unaërated blood is sent to the muscular tissue of the heart, and to the brain; hence the cardiac and the cerebral symptoms. A similarly engorged state of the cutaneous capillaries, consequent upon extreme relaxation of the minute arteries, is the probable cause of the dryness of the skin. An excessively engorged state of the capillaries is as unfavourable for cutaneous secretion as it is for pulmonary respiration. The dry and inactive state of the skin and the want of surface-evaporation tend to elevate still more the temperature of the blood; and the suppressed cutaneous secretion, being diverted to the kidneys, probably alters the quality of the urine, renders it irritating to the bladder, and explains the frequent micturition.

"This explanation of the phenomena is confirmed by the results of treatment. There is now a very general concurrence of opinion that the application of cold to the skin is the most successful remedy. The object to be kept in view is not merely, as it is generally stated, to cool the skin, or to excite the respiratory movements by the stimulus of the douche, but to cool the blood, and thus to restore the contractility of the minute arteries of the lungs. The condition of the pulmonary vessels in this disease is the exact opposite to their state in cholera collapse. In cholera collapse, the minute pulmonary arteries are in a state

of extreme contraction; and, as a consequence, the capillaries are extremely anæmic. In heat-apnœa, the pulmonary arteries are extremely relaxed; and the capillaries, consequently, are excessively engorged. In cholera collapse, external warmth in some degree, but much more rapidly and decidedly a warm injection into the veins, relaxes the arterial spasm, and restores the circulation. In heat-apnœa, on the contrary, the object is to cool down the overheated blood, so to revive the contractile power of the minute pulmonary arteries, to relieve the capillaries from their embarrassing excess of blood, and thus to remove the state of apnœa. A clear apprehension of these physiological principles cannot fail to be of great assistance in practice.

"In the treatment of heat-apnœa, the following appear to be the main points which require attention. The patient should be placed in a recumbent position in the coolest possible place, with a free current of air. The clothes should be removed, and cold water applied to the whole surface; or, if the symptoms be urgent, the clothes should immediately be saturated with cold water, without waiting to remove them. If the respiratory movements be failing and feeble, the cold douche is a powerful excitator; but if the breathing be rapid and laborious, it is better to envelop the body in a wet sheet, and to quicken evaporation and cooling by a fan or a pair of bellows. If the patient can swallow, let him drink iced water freely. Whether he can swallow or not, iced water may from time to time be injected. The marvellous effect of hot venous injections in cholera collapse, and the urgent need for cooling the blood in heat-apnœa, suggest the expediency, in extreme cases, of injecting into a vein the same saline solution as has so frequently been employed in cholera, only injecting it cold instead of hot.

"Dr. Morehead (*Clinical Researches on Diseases in India*) recommends venesection in the early stages of the attack, while Dr. Maclean condemns the practice. A routine practice of venesection would be destructive; but, when symptoms of excessive venous engorgement are present, a cautious venesection would be quite justifiable, and probably beneficial, on the well-known principle of lessening distension of the right side of the heart, and thus increasing its contractile power. When respiration has suddenly and quite recently ceased, artificial respiration by Dr. Silvester's method may possibly restore animation. While symptoms of apnœa continue, however great may be the apparent exhaustion, no alcoholic stimulants are to be given, for the reason that alcohol, as well as anæsthetic vapours and narcotics, impede oxidation of the nervous and other tissues, and therefore increase the risk of death from apnœa. Ammonia may be applied to the nostrils as a stimulant, and, if the patient can swallow, it may be given internally. Ammonia is a powerful diaphoretic, and the restoration of the cutaneous secretion is an important step towards recovery. When the skin becomes cool and moist, of course all cold applications are to be discontinued. To sum up, then—as *hot air* and *hot blood* are the cause of this form of apnœa, so *cold air* and *cold water* are the chief means of cure; all other means are subsidiary to these."

18. *A Cure for Headache.*—Dr. GEO. KENNION extols (*Brit. Med. Journ.*, June 13, 1868) the efficacy of the bisulphide of carbon in solution as a prompt cure for certain forms of headache.

The application is made as follows: "A small quantity of the solution (about two drachms) is poured upon cotton-wool, with which a small, wide-mouthed, glass-stoppered bottle is half filled. This, of course, absorbs the fluid; and when the remedy has to be used, the mouth of the bottle is to be applied closely (so that none of the volatile vapour may escape) to the temple, or behind the ear, or as near as possible to the seat of pain; and so held for from three to five or six minutes. After it has been applied for a minute or two, a sensation is felt as if several leeches were biting the part; and, after the lapse of two, three, or four minutes more, the smarting and pain become rather severe, but subside almost immediately after the removal of the bottle. It is very seldom that any redness of the skin is produced. The effect of the application is generally immediate. It may be reapplied, if necessary, three or four times in the day.

"The class of headaches in which this remedy is chiefly useful is that which may be grouped under the wide term of 'nervous.' Thus neuralgic headache,

periodic headache, hysterical headache, and even many kinds of dyspeptic headache, are almost invariably relieved by it; and, although the relief of a symptom is a very different affair, of course, from the removal of its cause, yet no one who has witnessed (and who of us has not seen?) the agony and distress occasioned by severe and repeated headache, but must rejoice in having the power of affording relief in so prompt and simple a manner."

19. *On the Pathology and Therapeutics of Disorders of the Nervous System, accompanied with Excess of Motility.*—Dr. STRANGE, of Worcester, classes under this title chorea, hysteria, epilepsy, paralysis-agitans, mimosa, and some forms of insanity. His object was to show, by a minute examination of the special symptoms of each, as well as from the general symptoms common to the whole group, that there was a family relationship between them all, and that their pathology must be looked for in the difference in the parts of the nervous system, rather than in any essential distinction between the morbid processes in each. Excess of motility showing a diminution rather than an excess of the nervous force, the treatment in all these disorders will be substantially the same; namely, by such means as should, 1st, improve the quality of the blood; and 2d, by presenting material easily assimilable by the nervous tissue. He had found the most rapid cures from the administration of alcohol, as food to the vesicular neurine, in frequent small doses (six to eighteen ounces daily), in chorea, hysteria, mimosa, etc., in conjunction, in some cases, with cod-liver oil, and from large doses of bromide of potassium in epilepsy.—*Proceedings of British Medical Association*, in *Brit. Med. Journ.*, Aug. 8, 1868.

20. *On some Forms of Visceral Neuralgia.*—Dr. ANSTIE, in a paper read before the Brit. Med. Assoc., discussed the subject of, 1, of neuralgia of the heart; 2, of the ovary and uterus.

1. Under the heading of cardiac neuralgia the author included every variety of the affection commonly known as angina pectoris. He endeavoured to show that, whatever the amount of organic change present in the heart or vessels, the essential feature of the disease, and that which constitutes its interest and its danger to life, is the element of neuralgic pain; or rather, that condition of the nervous system of which that pain is the prominent expression. So far is angina from being always, or nearly always, a rapidly fatal disease, that the author is convinced, from his own experience and from the study of recorded cases, that in the great majority of instances, this affection runs a decidedly chronic course, with intermissions, which completely characterize the neurotic origin of the disorder. In support of this position three series of facts were adduced. The first series included the narration of striking cases in which the anginal spasms recurred during fifteen or twenty years, and death at last took place, not from heart-spasm or heart-palsy, but from degenerative disease of the nervous centres. The second series of facts was concerned with the evidently close relations between angina and the ordinary neuralgias (as shown by the frequent occurrence of the latter in anginal patients), and with the intimate connection evidently existing between spasmodic asthma and angina pectoris. The third series of considerations included the arguments from hereditary taint, and these are, perhaps, the strongest of all. Not only is an angina itself frequently a direct inheritance (as in the celebrated case of Dr. Arnold, whose father had died exactly as he did), but the most ordinary care in inquiring about pain by history will not fail to produce a striking effect on the physician's mind by showing the extraordinary frequency—one might almost say universality—with which anginal patients will be found to have descended from a race strongly marked by tendencies to the more severe neuroses. These positions were illustrated by cases which had come under the author's notice; and the following general conclusions were drawn: 1st. That the essence of angina is a neuralgic condition which (by reflex action on the cardiac motor nerves) may produce either cardiac palsy or cardiac spasm. 2d. That the tendency to this neurotic condition is constitutional, and nearly always congenital. 3d. That the various organic lesions which have from time to time been found in anginal patients acted merely as greater or lesser *provocatives* to the neurotic disorder. The author then discussed in detail the treatment of cardiac neuralgia.

2. As regards uterine and ovarian neuralgia, the author remarked, at the outset, that those affections are distinguished from other neuralgias by the frequency with which *peripheral* sources of irritation are the most important factors of the neuralgic state. Considering the great copiousness of the nervous supply to the uterus and ovaries, and the powerfully disturbing character of the functional processes which are periodically recurring in these organs, we need be at no loss to understand how this should be. The most common variety of peritoneal neuralgia is that which attends certain kinds of difficult menstruation. It would not be correct, however, to give the name of neuralgia to the pain suffered in many cases of dysmenorrhœa, in which the suffering is apparently entirely dependent on and commensurate with the amount of obstruction to the escape of menstrual fluid, although its character somewhat resembles the neuralgic type. There is, however, a true neuralgic dysmenorrhœa, the subjects of which have exaggerated sensitiveness of the pelvic organs, and are, besides this, liable to neuralgia of other parts. In the virgin condition they suffer at every period from frightful pain, and this pain is not relieved, or is only most imperfectly relieved, on the occurrence of the flux. These young women, so far from having any mechanical conformation which forebodes sterility, are usually both perfectly apt for conception and child-bearing, and are also evidently benefited by the exercise of these functions. As a contrast to a case which he had related, of dysmenorrhœa from mechanical obstruction, in which marriage was sterile, and the painful periods continued after it, the author related two cases in which frightful neuralgic attacks which had accompanied menstruation in the virgin state diminished after marriage, and soon entirely ceased. This favourable alteration was coincident with an improvement in the general health, and a lessening of the general tendency to neuralgic and other nervous disturbances. The peripheral sources of irritation which give rise to uterine or ovarian neuralgia are not always situated in those organs themselves. Ascarides in the rectum, leucorrhœa of a purely functional nature and proceeding simply from the vagina, calculus of the kidney or ureter, scybalous feces in the rectum, and even the irritation of parts far more distant, may produce pelvic neuralgia in a reflex manner. Even a carious tooth has been known to produce this effect, and its removal to effect an immediate cure. There is, however, one kind of peripheral irritation locally connected with the uterus itself, which is probably one of the most frequent of all exciting causes of uterine and ovarian neuralgia—namely, displacements and flexions of the womb. It has been recently stated by Dr. Graily Hewitt—and the opinion of that high authority was fully confirmed by his (Dr. Anstie's) own much smaller experience—that the great majority, if not all, of the cases which Gooch grouped under the title of “irritable uterus” are really examples of uterine displacement or flexion. The kind of pain which attends these cases, although more or less continuous, is liable to periodical aggravation which assume all the severity of true neuralgia, and this severity is largely commensurate with the sensitiveness of the general nervous system. The author made full reference to the treatment, especially by subcutaneous injection of sedatives.—*Lancet*, Aug. 15, 1868.

21. *Ergot of Rye in the Treatment of Neuralgia.*—The object of this paper, read before the British Medical Association, by Dr. E. WOAKES, being to introduce the ergot of rye as a remedy in the treatment of neuralgia, a brief epitome of the writer's views of the pathology of this disease preceded the illustrative cases, this application of the drug being the direct corollary of his theory. Regarding shingles as more or less illustrative of all forms of neuralgia, the author referred the rash, and the pain in it, to the same cause; viz, effusion of liq. sanguinis from the ultimate branches of the artery in the track of which the symptoms appear. Tracing this artery to the skin in one direction, the effusion from a papillary arterial twig was seen to occasion a spot of herpes upon the cuticular surface of the papilla; tracing it in the direction of the corresponding sentient nerve, the fluid effused from the nutrient twigs (*vasa nervosum*) supplying it was found to occasion, by its mechanical disturbance of the sentient fibrillæ, the severe pain constituting the associated neuralgia. The cause of the effusion in such case was referred to a temporary suspension of the regulating

influence exercised over the minute arteries by the sympathetic nerve-fibres distributed to them. It was this suspended function that the ergot was supposed to restore, and so to allow of the removal of the fluid from its pain-causing situation. Five cases were reported; one of severe neuralgia following shingles, one of sciatica of four months' duration, one of hemicrania, and two of ordinary tic; in all of which cure resulted in from four to six days after commencing with the ergot.—*British Medical Journal*, Aug. 8, 1868.

22. *Zymotic Theory of Disease*.—DR. FARR, in his recent official report on the cholera epidemic of 1866, sums up his conclusions in regard to the zymotic theory in the following words:—

“It is now held by naturalists that each organ of the body has its proper life; and that it consists of minute centres of action, which have been called cells, globules, organic units, germs, granules, and other names. The cells, like the supposed vesicles of the clouds, are now shown to be solids, and Beale proposes to call them ‘germinal matter,’ which is perhaps a description rather than a name. ‘Monad’ would serve to designate these living particles, but as it, as well as the other names proposed, have been already appropriated, these units of force and life may be designated *biads*. Nearly alike under the microscope, *biads* differ infinitely in power and variety; for instance, the brain-cells of man in an early stage of development resemble the pus globules of ordinary inflammation. ‘Masses which could not be distinguished from one another [even by Dr. Beale], manifest the most remarkable differences in power.’ . . . ‘By chemical analysis every kind of germinal matter (*biads*) yields one substance resembling fibrin, another allied to albumen, fatty matter, salts, and water.’ Of these *biads* all bodies are built up.

“It is only with particular kinds of these *biads*, then, that we have to do in *zymosis*; and to give definite form to the theory, while *vaccine* lymph may be briefly called *vaccinine*, the granules of Chaveau may be named *vaccinads*; while those of *varioline* (smallpox lymph) are named *variolads*; those of *syphiline*, *syphilads*, and those of *cholérine*, *cholérads*, the choléragenic molecules of Pacini.

“It is life in this low form, where it is developed in isolated particles at war with those which constitute men, that generate zymotic diseases. An epidemic is the war of a conquering host of innumerable particles of life. It is therefore subject to the laws of growth and decay, both in the individual man and in communities.”—*Medical Times and Gazette*, August 15, 1868.

23. *The Solubility of False Diphtheritic Membranes*.—The *Journal de Chimie et de Pharmacie* for May contains a short review of the work of MM. BRICHETEAU and ADRIAN on this subject. One of the experiments is of interest: “A false tracheal membrane, weighing about twenty centigrammes, thick, resistant, and representing a square centimetre of surface, was placed in a tub containing about five grammes of water. To this was added two drops of lactic acid; the solution was then agitated. In two minutes the membrane began to disintegrate, and gave signs of dissolving. A few drops more of the acid brought about the complete solution of the membrane. A more complete result was obtained by using lime-water, so as to form lactate of lime. Solutions of potash and soda acted much less powerfully. Bromine water, chlorate of potassa, and common salt were all found less active in promoting solution of the membrane.” The authors, therefore, recommend the solution of lactic acid as the best topical application to the false membranes of diphtheria.—*The Practitioner*, July, 1868.

SURGICAL PATHOLOGY AND THERAPEUTICS, AND OPERATIVE SURGERY.

24. *On the Employment of Physostigma (Calabar Bean) in the Treatment of Tetanus and Chorea*.—DR. THOMAS R. FRASER says (*The Practitioner*, August, 1868) that “tetanus appears to be, essentially, a disease characterized by an

exaggeration of the reflex action of the central nervous system, resulting in spasmodic contractions. Hence, its most successful treatment seems to have been by the employment of such means as remove the condition of exaggerated reflex excitability, or oppose its manifestation.

Physostigma has the great advantage over all other drugs of directly and powerfully diminishing the reflex activity of the cord. (See number of this Journal for April, 1868, page 502 et seq.)

Dr. Fraser reports eleven cases of tetanus in which physostigma was used, and of these nine recovered and only two died.

Several cases have been recorded where tetanus has followed injuries and surgical operations, and where important nerve lesions have afterwards unmistakably indicated its cause. No great benefit can rationally be looked for in these cases from the employment of any drug.

The extract should always be used. It may be given in the form of pill or of solution in weak spirit of sp. gr. 0.920 (thirty-two grains to the fluidounce).

Dr. F. recommends the treatment to be commenced by subcutaneous injection, and to repeat such injection until the system is decidedly affected, and then to administer the remedy by the mouth, in a dose three times as large as is found necessary by subcutaneous injection. In the more severe cases, however, the subcutaneous injection should be alone employed. For an adult, one-third of a grain of the extract hypodermically will be generally sufficient to commence with. This should be repeated in two hours, when its effects will usually have passed off, and the succeeding doses may be modified according to the experience that will thus be gained. When used by subcutaneous injection, the dose of extract should be mixed with ten or fifteen minims of water. This mixture has always an acid reaction, which is sometimes so decided as to produce slight irritation of the cellular tissue; but this can be avoided by carefully neutralizing the mixture with a solution of carbonate of soda. It will be found necessary to repeat these doses frequently—every hour or every two or three hours—and, of course, the severity of the disease and the effect of the remedy will be the best indications for this. The doses must therefore be continued in increasing quantities until the physiological effect—diminution of reflex excitability—is produced, or until the sedative action of the drug on the circulation is carried to a dangerous extreme, or until constant nausea and vomiting compel us to desist.

As regards the treatment of chorea by physostigma, however promising it may appear, the experience we yet possess is much too limited to allow us to arrive at any decided opinion as to its value.

25. *Aneurism of Innominate Artery treated by Acupressure of the Carotid and Brachial Arteries.*—MR. GEO. MAY communicated the following case to the British Medical Association. J. W., æt. 38, suffered from aneurism of the innominate artery for twelve months. On August 19th, 1867, an aneurism-needle was passed behind the carotid, and the probe behind the brachial, close to the axilla. Arrest of pain and visible pulsation. The needle was removed after seventy-two hours. The pulse recommenced in temporal; ligature of carotid. The probe was removed from the brachial after ninety-six hours. There was return of visible pulsation in the aneurism on the twelfth day. The author made the following deductions: 1. Early period at which collateral circulation becomes established. 2. Importance of securing carotid and subclavian arteries simultaneously. 3. Advantage of acupressure over ligature. The following were the results of the treatment: Partial arrest of growth of aneurism. Patient able to do easy work.—*Brit. Med. Journ.*, Aug. 8, 1868.

26. *New Operation for Securing the Arteria Innominata and the Subclavian in the First Part of its Course.*—DR. HARGRAVE, in a paper read before the Surgical Society of Ireland, proposes the following operation as not only feasible but worthy of testing.

“First, to expose the subclavian in the first part of its course, or the innominate, and to pass the ligature around the vessel, then to saw through the clavicle about its external fourth; my object in encircling the artery with the ligature

before the section of the bone is made, is that we cannot predicate what disturbing influences in the relation of the parts will follow it; they might be considerable or nothing, we guard against any untoward result of such section, by acting as suggested as regards the ligature than tie it. By this proceeding, when the shoulder is deprived of its support by the clavicle it approaches to the thorax; the consequence of which is that the tension of the artery is relaxed, the vessel and the ligature are at rest, not disturbed by any of the motions of the shoulder, and no risk of the vessel being in any way lacerated and giving rise to hemorrhage is obviated. By referring to the dead subject, or in place of it, the anatomical plate representing the course of the subclavian, it will be seen what little support it receives from the surrounding tissues; in fact, it represents a tense full tube, extending from its origin, and resting more or less on the apex of the pleura costalis, till it reaches the first rib, and is not well supported by soft parts till it is escaping from beneath the clavicle into the axillary region. By adopting this plan for securing the subclavian by a single operation, it guarantees, as far as operative surgery can effect, perfect quietude, and less tension to the vessel after the ligature is applied to it. It can be urged against this proposal that the injury to the clavicle is a great objection, complicating it by producing a compound fracture of that bone; it must be borne in mind that this lesion is made in the most cautious and careful manner, admitting that osseous union does not follow it, still the patient will have very great, almost perfect, use of the upper extremity in all its motions.

"One word as to the kind of ligature for large arteries. From my experience of its value on the common iliac artery, no better ligature can be used than that of hemp, *from the firm way in which it remains on the artery, the complete absence of irritation, and no alteration in its strength and soundness.*"—*Medical Press and Circular*, March, 11, 1868.

27. *Popliteal Aneurism*.—The following case was under the care of M. JARJAVAY. A man æt. 40, has had a tumour in the left ham for sixteen months. It increased first slowly, then more rapidly, till, on admission, it was as large as the head of a new-born child. The skin over it was red and inflamed—the knee-joint stiff, the leg swollen, and there was no pulsation in the tibials. He was ordered rest and fomentations. A week after admission, a sudden and severe accession of pain coincided with an enlargement of the tumour. To relieve pain, the patient compressed the artery. Ice was applied. Next day digital compression was begun, and continued at intervals during three days. The impulse was by this much diminished, though not completely stopped. The skin over the tumour began to slough; and, during the next month, the daily details are only of the spread of the sloughing, and the discharge of coagula. Gradually the tumour was emptied, and disappeared; no active hemorrhage appeared; and on January 14, 1868, the patient was discharged cured of his aneurism, though the motions of the limb were considerably impaired.—*Ed. Med. Journal*, Aug. 1868, from *Gazette des Hôpitaux*, No. 9, 1868.

28. *Torsion of Arteries as a Means of Arresting Hemorrhage*.—Mr. T. BRYANT, read before the Royal Med. and Chirurg. Soc., an interesting communication on this subject. He described the two methods by which torsion may be practised, viz., the free and the limited. "In free torsion the end of the artery should be fixed by a pair of clasp forceps, and twisted freely. In 'limited' torsion, the artery, having been drawn out of its sheath, should be fixed transversely about three-quarters of an inch from its divided extremity by a pair of clasp forceps, and held steadily; whilst with a second pair of forceps the free end of the vessel should be twisted freely, as in the former kind. The object of the first pair of forceps being to fix a limit to the twisting of the vessel, and prevent the artery being separated for any distance from its vascular attachments. Three or four complete revolutions of the forceps are enough for small arteries, six or eight for large."

Mr. B. gave the details of a number of experiments made by him on animals, and described the physiological conditions of the arteries subjected to torsion.

The following are his conclusions: "1. That hemorrhage may with certainty

be arrested by torsion from even the largest vessels. 2. That it is a safe and judicious practice in all cases in which the vessels are small or of moderate calibre; and that, as far as experiments and practice yet prove, it is equally so in arteries of the first magnitude. 3. That torsion may be 'free' or 'limited,' the free method being applicable to vessels of moderate size, and even to the largest of the extremities, limited torsion being more adapted for the large and loosely-connected vessels. 4. That in torsion, as in the ligature, the permanent hæmostatic processes are alike due to the sealing of the divided inner and middle tunics; but that in the ligature there is only an irregular division of these tunics, whilst in torsion there is a complete division, separation, retraction, and valvular incurvation. 5. That in torsion the twisted cellular coat forms, with the retracted and incurved middle coat, the direct mechanical obstacle to the flow of arterial blood, in the same way as the compressed cellular coat does in the ligature, but that in torsion the twisted cellular coat and incurved middle coat become subsequently a permanent means of occluding the end of the artery, whilst the ligature of necessity becomes subsequently a source of irritation, and too often a means of undoing what has been done by nature's own hæmostatic processes. 6. That in torsion the twist in the cellular coat of an artery, the division and subsequent retraction, incurvation, and adhesion of the middle coat, and the coagulation of the blood in the vessel down to the first branch, are the three points upon which its temporary as well as permanent safety depends, whilst the permanent safety of acupressure rests upon the last point alone, and its temporary effects upon the pressure produced by the needle. 7. That there is every reason to believe that when torsion has been successful on its first application, the fear of subsequent hemorrhage is altogether groundless, for there is nothing, as there is in the ligature, to interfere with the physiological processes set up by nature to occlude the divided vessel, and, unlike acupressure, the temporary obstacle to the flow of blood becomes a permanent one. 8. That upon physiological grounds torsion has decided advantages over the ligature and the acupressure-needle, and that if subsequent experience confirms what has been hitherto observed in the experiments on animals and the application of the practice in the human subject, we shall have gained a point of no mean importance, and simplified surgery in no slight degree. The paper was concluded by the author stating his belief that the practice was a safe and valuable one in many cases, if not in all; that it was not a crude idea, based upon a theory spun out of a fertile imagination, for it had its origin in observation of nature's own processes; that it was based on the well-recognized physiological principles of natural hæmostatics; and that it was artificial only so far as the surgeon's art was employed in rendering these processes most available."—*Lancet*, Aug. 15, 1868.

29. *Torsion of Arteries*.—Dr. G. M. HUMPHRY laid before the British Association the results of his experience of torsion of arteries after operations, as well as the results of experiments on animals, and on the arteries of man and animals after death. For many months he has practised torsion after all operations, including three amputations in the thigh, amputations in the leg, of the breast, excision of the knee, etc. It has answered quite well. There has been no after-hemorrhage in any of the cases; the wounds have healed more quickly, and there has been less pain, than after the ligature. The operation is rather more troublesome, and requires more care and time, than the ligature. He simply seizes the end of the artery with strong forceps, and, holding the forceps in the axis of the vessels, twists till the portion included in the grasp is twisted off and the forceps are quite free. He believes this method to afford the greatest security, and does not recommend the practice of holding the vessel with a second pair of forceps above the part to be twisted. In the case of the smaller vessels, he strongly recommends torsion, as it enables the operator to secure any number without leaving in the wound any foreign substances or ex-citators of sloughing or suppuration. With regard to larger vessels, such as the femoral, additional experience is required before we can be assured that it is a sufficiently safe substitute for the ligature. In the process of torsion, as observed upon an artery twisted after death, the thick, inner, musculo-elastic coat

is first severed, often as though it had been cut by a knife or ligature. As the torsion goes on, it is so compressed or squeezed by the twisting of the outer coat, that its divided edge is commonly turned up, reflected, into the tube of the artery, to a greater or less extent, as the resistance of the outer coat is more or less prolonged, forming a valvular or funnel-like projection into the vessel. Thus there are the two things—the inversion of the inner coat, and the twisting of the outer. It is upon the latter that reliance is to be placed for resistance to the flow of fluid from the vessel, inasmuch as its pressure causes and maintains the valvular inversion of the inner coat, and, further, by its own strength, offers a direct obstacle to the escape of the blood. This the professor has proved by injecting water, and connecting a column of mercury with the vessel. The fluid first distends the end of the vessel, untwisting it a little, so as to pass through the valvular opening or separated surfaces of the inner coat; then, coming into contact with the outer coat, distends it or unfurls it, or finds an escape through some weak point in its wall. Thus the strength and firm twisting of the outer coat, compressing the inner so as to prevent the passage of blood beyond it, and these withstanding the further escape of the fluid, give the measure of the resistance to the pressure of the column of fluid within the vessel. The amount of this resistance to the pressure of a column of mercury in the same vessel, twisted apparently in the same manner, varies a good deal. Sometimes from ten to twenty inches were borne: at others, not more than three or four. Professor Humphry had been unable to discover the cause of, or to prevent, this uncertainty; and it makes him speak with some hesitation as to the applicability of torsion to vessels of large size. In experimenting on the large arteries of animals, also, he has occasionally found the twisted vessel give way before the wound was closed, requiring it to be twisted again, which was ultimately done with success in every instance. Some improved mode of practising the operation may prevent this. If the vessel is so twisted as not to give way in the first instance, it is, so far as his observation goes, quite secure, and in the later stages even more so than the ligature, there being less liability to the ulcerative suppurative processes which are to some extent necessary attendants upon the ligature. Accordingly, the appearances found on examination of the wound, at various periods after the operation in animals, were much in favour of torsion.—*Brit. Med. Journ.*, Aug. 8, 1868.

30. *Amputation of the Right Arm at the Shoulder-joint, and Excision of the Scapula for Severe Injury of the Limb.*—This case, which was communicated to the British Medical Association, at its late meeting, by Mr. V. JACKSON, was that of a man admitted into Wolverhampton General Hospital, December, 1864, having previously been knocked down on the railway by the buffer of an engine, the wheel of which passed over his arm. The injuries were so severe that the removal of the limb at the shoulder-joint, followed by excision of the scapula, offered the only chance of saving life. The author drew particular attention to the fact that the scapula had been excised by sawing through the acromion process, thus saving the point of the shoulder—the first time, in fact, that this had been done, all previous excisions of the entire bone having involved a portion of the clavicle.—*Medical Times and Gazette*, Aug. 15, 1868.

31. *Origin and Treatment of Stone in Boys.*—MR. THOMAS SMITH refers (*Proceed. Brit. Med. Assoc., Brit. Med. Journ.*, Aug. 8, 1868), the existence of stone in the bladder, for the most part, to defective secretion from certain organs, whereby the kidneys were forced to excrete more than their due share of refuse material; or to disarrangements of the digestive organs, whereby abnormal substances might be formed and added to the urine, or the natural urinary excreta might be formed in excess. He endeavoured to explain the frequency of stone among the children of the poor, and its rarity among those of the rich, and the equal liability of both classes to the disease in adult life. The ordinary and the unusual symptoms of stone were noticed. A case was related where the author had crushed a stone between his finger and a lithotomy-staff, thus relieving the child altogether of his disease. Attention was drawn to the great difference in the mortality of lithotomy, as drawn from general statistics, and as

containing the experience of individual surgeons. As means whereby lithotomy might be facilitated and its mortality lessened, the author recommended that the bladder should be nearly empty at the time of operation; he described a method of manipulating the staff so as to diminish the size of the wound necessary for the extraction of the stone, and recommended the use of very long and slender forceps. The introduction of a canula surrounded by a conical plug of lint immediately after the operation was strongly advocated, and cases were referred to in the author's experience where he believed life had been saved by this means. The paper had appended to it a table of twenty cases of lithotomy in boys.

32. *Results of the Operation for Lithotomy Performed at the Manchester Royal Infirmary from 1853 to 1868.*—Mr. GEO. SOUTHAM communicates the results of thirty-eight cases of lithotomy operated on by the author at the Manchester Royal Infirmary, all of which were successful except one, the subject of the fatal case being a man in his 79th year, with enlarged prostate; the calculus extracted weighed two ounces; was spiculated, and formed chiefly of oxalate of lime and lithic acid. The ages varied from one year and nine months to seventy-nine years, and the weight of the stones from nine grains to five ounces. The cases were not selected, except that no adult has submitted to the operation where the calculus was supposed to be under the average size, and the urinary organs in a favourable state for lithotrity, of which there were seven. Full details of thirty-two cases were given, eleven of which occurred in adults; in six of these the calculi varied in weight from one and a half to five ounces, and in five from five and a half to seven and a half drachms. Taking into consideration that the most favourable adult cases were reserved for lithotrity, the author considered a mortality of one in thirty-eight proved that lithotomy is not the dangerous operation it is commonly held to be. He did not, however, wish to disparage lithotrity, which he considered the preferable operation, where the bladder-pustule and urethra were in a healthy condition, and the stone of average dimensions, and he generally adopted it in private practice; but where complications occur, and they are not of a nature to contraindicate operative interference, he believed lithotomy afforded the best prospect of preserving the lives of our patients. He pointed out some of the circumstances which he considered had contributed to the successful results in his cases. After alluding to the importance of preparatory treatment, several suggestions for facilitating the different stages of the operation were given. He advised free incision through the skin, areolar and adipose tissue, but those into the membranous and prostatic portion of the urethra should be very limited, the elasticity of the neck of the bladder in children and early manhood admitting of its free dilatation. To obviate the difficulty which sometimes occurs in reaching the urethra, he advised the direction of the knife to be altered according to the age of the patient. The pelvis of the child being smaller and placed more obliquely on the spine than in the adult, the bladder is almost an abdominal organ in early life, sinking into the pelvic cavity as this increases in capacity. Therefore, to find the urethra readily in children, the point of the knife should be directed obliquely upwards in a line with the inner border of the arch of the pubes; whilst in the adult it should be kept more horizontal. Additional facility in this stage of the operation is afforded by allowing the nail of the fore-finger to grow longer than usual, which, passing more readily into the groove of the staff, becomes an excellent director for the point of the knife. Especial attention was paid to the prevention of the injurious effects of shock. Immediately the operations were completed, the patients were enveloped in a warm blanket, and on being placed in bed, bottles filled with hot water were applied to the feet and other parts of the body, until the signs of reaction set in. In the after-treatment, the patients were allowed nutritious food as soon as the stomach was in a fit state to receive it. The paper was illustrated by drawings, and the calculi extracted were exhibited.—*Brit. Med. Journ.*, Aug. 8, 1868.

33. *Tracheotomy in Croup.*—In the 1st No. for 1868, of the *Jahrbuch der Kinderheilkunde*, Professor STEINER presents us with an abstract of his expe-

rience in regard to the results of the operation of tracheotomy in croup. In the course of four years the operation was resorted to in 52 children—33 boys, 19 girls—affected with the disease. In 18 of these—11 boys, 7 girls, or 34.6 per cent.—with a favourable result. In the 34 unfavourable cases, 35 presented a croupal affection of the larynx, trachea, and bronchi, the effusion being either tubular, membraniform, or in isolated patches. In many instances the effusion was, in great part, of a soft puruloid character. In one case the trachea and bronchi were filled with an ichorous matter, while the croupose excretion was found in the larynx. In one instance congestion of the bronchi was met with, in a boy who died forty-nine days after tracheotomy. There was regularly pulmonary emphysema; in five cases there was croupose pneumonia; in six, croupose lobular pneumonia; in one case gangrene; in six cases pleural adhesions were present; in two cases ecchymosis of the visceral pleura. The brain was almost invariably congested, while the solitary follicles of the small intestines were in a state of evident intumescence, whether as a concomitant of the disease, as an effect of the emetics administered, or a product of acute inanition. In three cases, besides disease of the throat and larynx, there was not present any other apparent lesion, death being attributable to a morbid change in the crasis of the blood. In two cases of death three weeks after tracheotomy, there was, besides excessive anæmia, no other lesion that could be detected; the mucous membrane of the larynx and bronchi was entirely normal. In two cases there was cholera from gastro-enteritis—that is, the epithelium of the mucous membrane of the small intestines was in a state of general desquamation—the epithelium itself very much clouded, and beset with molecules and drops of fat. In one case of a four year old boy, death from hemorrhage occurred on the seventeenth day after the operation. The blood proceeded from an ulceration of the middle lobe of the thyroid gland, with loss of substance of the mucous membrane of the trachea, corresponding with the lower side of the canula. In one case the fatal event was attributable to the coincidence of hooping-cough and chronic hydrocephalus. During the first five years of life the mortality of croup after tracheotomy was the highest. Of thirty-one cases operated on at this period, twenty-five died. The first three years after the operation proved the most critical. The cure is to be dated from the time when the use of the canula can be definitely disposed of. There was a liability for the cure to be retarded or prevented by a chronic swelling of the laryngeal mucous membrane, a remnant of the croupose inflammation; ulceration as a result of laryngeal croup; contraction, from cicatrization, of the mucous membrane of the larynx; paralysis of the glottis; luxuriant granulations formed at the edges of the incision in the trachea, which form a tongue-shaped projection within the respiratory tube; infiltration of the skin and cellular tissue, with change of substance in the immediate neighbourhood of the artificial opening into the trachea. Bronchial croup may be protracted to a chronic stage by the freedom and normal functions becoming, at short intervals, restored and again interrupted. In such cases the bronchial disease may outlast for many weeks the laryngeal croup. The canula was withdrawn in four cases on the 28th day; in three cases on the 20th; in two cases on the 10th; in two on the 21st; in two on the 25th; and one on the 17th, 30th, 34th, and 35th days respectively; in one case not until fifteen months after the operation. Tracheotomy, according to Prof. Steiner, is the most successful when not too long postponed. It should be resorted to so soon as emetics cease to afford relief, or emesis can no longer be produced; or when no longer remissions occur between the croupal paroxysms. As to the part at which the opening into the respiratory tube should be made, this must in each case be left to the judgment of the practitioner. In the Prague Hospital for Children, the operation is usually performed low down in the trachea. It should be done without the use of an anæsthetic. A double canula, of as large a calibre as possible, and of a sufficient length, is to be immediately after the incision is made, introduced through it into the trachea, and kept there so long as the croupal inflammation continues. The treatment subsequent to the operation is of great importance to insure a successful result. And it is in consequence of this being more closely and fully attended to in the wards of the hos-

pital than elsewhere, that the operation has been attended with greater success there than in private practice. The air of the patient's chamber should be kept constantly pure by free ventilation, and of a mild, even temperature. Immediately after the operation there should be applied loosely around the patient's neck a cloth wet with water. In cases marked by an inflammatory reaction in the neighbourhood of the incision in the trachea, the wet cloth should be frequently renewed at short intervals. A spoonful or two of wine should be given to the patient after the operation, and he be left to sleep. After awaking he should be given some appropriate nourishment, as milk, meat broth, eggs, easily digested meat, beer, wheat bread, etc. The presence of fever does not contraindicate the use by the patient of appropriate food. The medical treatment must be governed by circumstances. When there is free mucous secretion, with copious expectoration, ipecacuanha alone, or in connection with *extr. cort. cinchon.* will be indicated. When there is much fever present, infusion of digitalis with nitre, or a few drops of the simple tincture of opium, with cold fomentations to the chest. When there is constant dyspnoea, *arnica*, *liq. ammon.*, anise, benzoin; when collapse ensues, wine, camphor, musk. When there exists faucal croup, gargles of chloride of potash will be proper; or, in quite young children, the throat should be washed with a solution of nitrate of silver. Both tubes of the tracheal canula must be kept perfectly clean, within and without; and to this end they should be removed and separated at proper intervals. A continued irritative cough often results from ulceration of the tracheal mucous membrane, produced by an accretion upon the portion of the canula within the trachea; when infiltration takes place, followed by loss of substance at the edges of the wound in the windpipe, the proper remedy is the application of portions of charpie, wet with a solution of chloride of potash, half a drachm to one drachm in three to six ounces of water. When gangrene is threatened, the proper remedies are chloride of potash, quinia, acids, and wine.—*Viertel-Jahrschrift f. d. Prak. Heilkunde*, Drit. Bd. 1868.
D. F. C.

34. *Strangulated Hernia in Infants*.—E. W. WIMER (*Ploss. Ztschr. f. Med.*, etc., 1868) has collected the histories of forty-eight cases of strangulated hernia in young children. Three-fourths of the cases occurred in the first and second years of infancy; very few at a later period, as most congenital herniæ become cured before the third year. Nearly all of the herniæ found strangulated in infants were inguinal. The longer the strangulation continued, the more unfavourable the prognosis. Of the forty-eight cases above referred to, twenty-six were operated on, eighteen were reduced by taxis, and three were treated therapeutically. Of those operated on, eight died; of those reduced by taxis, three died; as did also one of those treated therapeutically.—*Centralblatt f. d. Medicinsc. Wissenschaftn.*, 1868, May.
D. F. C.

35. *On the Mortality Arising from Abdominal Hernia, with Suggestions for its Diminution*.—Mr. JOHN BIRKETT, in a paper read before the British Med. Assoc., quoted the returns of the Registrar-General to show that the death-rate from hernia in the London districts averaged 149 per annum; and in England, 826. The causes of death were stated to arise from prostration, peritonitis, and injury of the bowels; and the fatal results could only be averted by reducing the protrusion as quickly as possible by the taxis, and when that failed by operation. He especially deprecated delay and violence in replacing the hernia, both these circumstances producing many deaths annually.—*Brit. Med. Journ.*, Aug. 8, 1868.

36. *Treatment of Rupture of Ligamentum Patellæ and of Transverse Fracture of Patella*.—M. SISTACH is of opinion that position and immobility for a sufficient length of time are quite sufficient to effect a good cure, without any use of the compressive bandages and apparatus so generally used, which are liable to do harm rather than good, preventing the nutrition of the limb, and specially the formation of the new material which is to unite the divided ends of the tendon, causing atrophy of the limb and local scurvy.—*Gazette Méd. de Paris*, No. 11, 1868.

37. *Removal of Cancer by Caustic Arrows and Carbolic Acid.*—Dr. J. R. WOLFE related to the British Association two cases. In the first, there was epithelial cancer in the inner canthus, involving both eyelids, of nine years' standing. Four openings were made around and one in the centre of the tumour, into which were inserted caustic arrows. On the third day the tumour came away; the wound was treated with carbolic acid dressing, at first strong, afterwards diluted, and with the application of carbolized wadding dipped in glycerine; it healed in a fortnight. There was no relapse, and scarcely a trace of a cicatrix remained. The second case was one of cancer of the lower eyelid and cheek, removed in the same way. The patient was discharged in eighteen days. There was no relapse. The advantages of this mode seem to be—1. Little or no pain; no confinement to bed required. 2. Complete extirpation of the diseased part. 3. The gap left granulates freely, without leaving any mark. 4. It is valuable for removing tumours from regions where no skin can be obtained from the neighbourhood, and is also applicable to erectile tumours, naevi, cancer of the breast, etc., occurring in particular persons, places, or seasons of the year, when the use of the knife is to be dreaded. The arrows are prepared by making chloride of zinc into a stiff paste with starch, rolling into shape and drying. Dr. Wolfe showed that obliteration of the lachrymal sac, etc., did not necessarily induce epiphora or any discomfort, referring to the result of his own experiments on rabbits, which proved that the lachrymal gland was by no means the main source of the tears, which continued after the removal of that gland.—*Brit. Med. Journ.*, Aug. 8, 1868.

38. *Villous Tumour of the Rectum, and the Resemblance it may bear in its Symptoms to Chronic Dysentery.*—Dr. H. M. TUCKWELL communicated to the British Medical Association two cases, the chief clinical interest of which consisted in the remarkable resemblance which they bore in their symptoms to chronic dysentery. Characterized by a sallow cachectic aspect of the patient, by very frequent action of the bowels, with severe tenesmus, by persistent and intense pain in the lower part of the back, and by slimy discharges mixed with blood; they showed how dysentery might be closely simulated by villous tumour of the rectum, that nothing but a most careful examination of the rectum would serve to distinguish the one disease from the other. In both cases the villous growth, of considerable extent and size, occupied the posterior wall and sides of the bowel, reaching from about four inches above the anus into the sigmoid flexure. It was thus quite possible, *unless the rectum was examined directly after an action of the bowels, when, with the violent downward straining present in this disease, the villous processes were forced down within reach of the finger*, to overlook the presence of the tumour. In neither case was there any evidence of obstruction of the bowels, so commonly met with in this form of tumour, to aid in the diagnosis. The immediate cause of death in both instances was perforation of the bowel through the base of the tumour; the opening in the one case leading directly into the peritoneum, and death following from general peritonitis; in the other case just missing the peritoneum, and leading into the connective tissue between the bowel and the sacrum, where a large abscess had formed, which terminated in pyæmia and secondary abscesses in the lungs.—*Brit. Med. Journ.*, Aug. 8, 1868.

39. *On those Secretions which are, and on those which are not, the Means of Communicating Constitutional Syphilis.*—Mr. HENRY LEE, in a paper read before the British Med. Assoc., related typical cases of two distinct kinds of syphilitic infection, and dwelt upon the test of inoculation as distinguishing the two varieties. It was not every pustule, he observed, which was to be considered the true specific pustule; for he related the case, and showed the drawing, of a well-developed pustule at the expiration of fourteen days, produced by inoculating some simple pus from a case of excision of the knee-joint. Mr. Lee then referred to his original observations on the inoculation of matter from indurated sores. The conclusions at which he had come were that the secretions from indurated sores under irritation were sometimes inoculable; but that the inoculations dif-

ferred from those performed from the secretions of suppurating sores. He next referred to the confusion that existed in the writings of those who professed to have given their attention to the subject; and instanced the Report made by the Committee on Venereal Diseases last year to the Secretary of State. After examining sixty-four witnesses, and producing a report extending over upwards of 600 pages, the committee came to the conclusion that no one could tell whether a given local affection would contaminate the system or not. The committee described a local sore which did not infect the system, and a simple sore which did; but they drew no distinction between these two diseases, and the author of the paper thought that it was simply begging the question to say that a sore was local because it did not infect the constitution, and that it did not infect the constitution because it was local. A patient would find out for himself that a sore was syphilitic when he had secondary symptoms; and this was all the committee considered that a medical man could do. Mr. Lee, on the contrary, recognized two distinct kinds of disease, each of which followed its definite laws. There had been no instance, he observed, in which the inoculation of the secretion of the specific pustule, or of the sore which resulted from this, had given rise to constitutional syphilis; and he explained the confusion that had arisen upon this subject by a quotation from Professor Owre, in which it is stated that, in the experiments upon syphilization, no such care was taken in the selection of the matter as would appear from the printed statements, but that both kinds of matter were used indiscriminately. The author's conclusions were: 1. That the infecting form of syphilis is communicated by the secretions of both primary and of secondary syphilitic disease. 2. That the secretion of any other specific disease (including the secretion of specific pustule and the suppurating sore which results from it) has no power of imparting constitutional syphilis. 3. That the natural secretions of glands in syphilitic subjects, when those glands are not themselves specifically diseased, have no power of imparting constitutional syphilis.

As this is a subject of general interest, we append the remarks made by the President of the Section, Mr. Paget: "Mr. Lee's paper seems to me," said he, "to offer a fair explanation of some of those cases in which secondary syphilitic affections have followed, and have appeared to be the consequences of, soft chancre. Such cases have occurred to most surgeons; and yet so rarely in comparison with those in which secondary symptoms follow hard chancre, that they seem insufficient to disprove the law according to which hard chancre or diseases derived from it are the necessary precedents of secondary symptoms, the sole sources of constitutional infection. A law of this kind, if there be one, can have no exceptions. What seem to be such must, if the law exists, be erroneously or incompletely observed facts. And here the incompleteness of the observations in some of the assumed exceptions may have been, as Mr. Lee suggests, that a patient has had a soft chancre at or about the same time as he has been infected from a hard chancre, the virus of which has traversed sound textures, and has produced in them too little change to be observed. It must have occurred to every one seeing many cases of syphilis to meet with patients having secondary or tertiary symptoms, who have nevertheless been unconscious of having ever suffered with primary disease. Such cases are commonly explained away or disbelieved. They may have been instances of infection through textures which were not observably contaminated by the transmission of the infecting material through them. Such a transmission is sometimes observed with the poison of dissections; and although one may doubt much of what some believe respecting the derivation of pus-cells from exuded white blood-cells, yet it is quite certain that pus-cells and others like them may pass through membranes having no visible apertures, and may leave no visible traces of their passage. The doctrine of essential difference between infecting and non-infecting, hard and soft, chancres is in the same position as many others in pathology. We seem to have discovered a general law: the facts in support of it are many; those against it are very few—we are justified in suspecting that these are incompletely or erroneously observed, and are not what they seem to be."—*Lancet*, Aug. 15, 1868.

40. *Arrest of Testicle in the Inguinal Canal.*—In the *Prague Quarterly Journ. of Pract. Medicine*, No. XXXV., 1868, Dr. SZYMANOWSKI treats of this accident, and recommends, in cases of retention of the testicle, after every chance of a spontaneous descent has been afforded, to resort to an operation somewhat similar to that proper in the case of strangulated inguinal hernia. The operation is, as Baum has shown, entirely without danger. Of the twenty-two cases of operation collected by Dr. S., but one death is recorded, and that not as a direct result of the operation, but of intercurrent erysipelas. It is important that an operation in cases of arrest of testicle, should not be resorted to too early, inasmuch as cases occasionally occur where the testicle, after remaining arrested for some time at the groin, finally descends into the scrotum; neither should the operation be delayed when the occurrence of severe disease is threatened. Especially is a prompt extirpation of the testicle demanded when a morbid condition of the organ is apprehended. D. F. C.

OPHTHALMOLOGY.

41. *Sulphate of Soda as a Means of removing Opacities of the Cornea.*—Mr. HENRY POWER reports (*The Practitioner*, September, 1868) favourably of the efficacy of the sulphate of soda for removing the curable forms of opacity of the cornea. It is well known that while superficial opacities, the result of recent inflammation, especially in children will often disappear through the influence of the natural powers; while those opacities produced by burns or caustics, or which are the result of perforating ulcers with adhesion of the iris are permanent. In those forms of diffused haziness resulting from hypertrophy of the corneal epithelium or where the spaces between the lamellæ are enlarged and filled with nuclei and imperfectly formed cells, proceeding from the proliferation of the ordinary corpuscles, after the inflammation has subsided, local stimulants may be useful.

Dr. P. says that not more than one or two grains of the sulphate of soda should be applied to the eye at any one time, and that the most convenient mode of application is to invert the upper lid and brush the powders lightly over the surface with a camel's-hair brush. This may be repeated daily, or on every second or third day, according to the degree of reaction which follows. The immediate effect is, he says, to produce a considerable degree of redness and sharp smarting pain, with lachrymation, lasting half an hour or more. In some cases the reaction is too violent, in which case the salt may be mixed with a little starch, or it may be applied in solution, five grains to four ounces of water.

42. *Hypodermic Injection of Atropia in Threatening Glaucoma.*—A special hypodermic application of atropia which appears to promise the most valuable result, is its use in painful iritis, and especially in threatening glaucoma. Dr. Anstie firmly believes that in two cases he has succeeded in preventing the latter affection from developing itself; at least the most threatening symptoms were present, and rapidly subsided under the use of $\frac{1}{60}$ th grain injections of atropia.—*The Practitioner*, July, 1868.

43. *Remarkable Development of Cysts in the Retina.*—Mr. G. LAWSON exhibited to the Pathological Society, March 3, an eye which he had removed from a patient in the Royal London Ophthalmic Hospital, Moorfields, under the following circumstances: The man had received, fifteen years previously, a penetrating wound in the right eye, which, in the course of twelve months, led to complete loss of vision. Up to last November the blind eye had never caused him any discomfort, when, without any apparent cause, it became inflamed and painful, and in a few weeks the sight of the sound eye was affected by it. As all treatment failed to give relief, he was in January of this year admitted into

the hospital, and Mr. Lawson removed the eye. At the time of his admission the eye was glaucomatous, its tension was greatly increased, and it was very painful. The lens was milky-white and chalky, so that no ophthalmoscopic examination could be made. On making a section of the eye, the optic nerve was seen deeply cupped; the retina was *in situ*, but slightly detached from the choroid, and its outer surface was studded with numerous small cysts (eleven in number), the largest of which were about the size of a small pea.

Mr. HULKE remarked on the great interest of the case. The cysts were not spaces in the connective tissue; they had a wall of their own, and an internal epithelium, as in the iritic cysts he had described.—*Med. Times and Gaz.*, March 21, 1868.

44. *Fracture of the Nasal Bones and Right Superior Maxilla, with Displacement of the Ball of the Eye.*—VON LANGENBECK relates, in the *Arch. f. Ophthalmolog.*, xiii., the case of an officer of a railroad, who, in consequence of an injury inflicted on him by a locomotive engine, had the bones of his nose entirely crushed in, at the same time a fracture was produced of the orbital process of the right upper jaw; an opening was made into the right antrum, with laceration of the eyelids and right cheek. The eye had been forced through an opening in the floor of the orbit, of a finger's breadth, into the right antrum, in such a manner that the axis of the eye was directed perpendicularly upwards. By separating, as far as possible, the edges of the fracture in the orbital plate, the globe of the eye was replaced in the orbit with a continuance of the power of vision. After the healing of the wounds in the eyelids, there was an inability to raise the upper one, and, in consequence the sight was interfered with. By two plastic operations this difficulty was removed to a sufficient extent to enable the patient to see with the injured organ. After a time this became attacked with suppurative *keratitis*, with wasting of the entire globe.—*Centralblatt f. d. Medicinisch. Wissenschaft.*, No. 23, 1868. D. F. C.

MIDWIFERY.

45. *Decidua Menstrualis.*—The membrane discharged from the uterus. in certain cases of painful menstruation, according to the investigations of HAUSMANN (*Monatsschr. f. Geburtskunde*, 1-12, 1868), never presents a complete, continuous cast of the cavity of the uterus, but always consists of three or more pieces. These, on their inner surface, present openings corresponding with the orifices of the uterine glands, but are never covered with a continuous epithelium. In common with other observers, he detected, in these cases, the presence of a number of uterine glands, with rounded or spindle-shaped cells, and a few free nuclei, disproportionate to what is met with in the normal condition of the uterine mucous membrane. The external surface of the so-called decidua of menstruation presents layers of loose, open, for the most part, fibrous tissue. Upon it Dr. H. has seldom observed the free bulbous terminations of the uterine glands. A reference to the cases upon record will show, that in no instance has the discharge of the membrane referred to occurred at the end of regular periods of four weeks each, but always at irregular and longer periods, while there is no well authenticated case given of its discharge occurring in a virgin. In addition, Dr. H. remarks, the details of individual cases are given where the patients have escaped the discharge of the so-called decidua and its attendant sufferings only so long as they abstained from sexual intercourse. Dr. H. concludes, therefore, that the membrane in question is in all cases the result of an abortion, occurring during the first weeks of pregnancy.—*Centralblatt f. d. Medicinisch. Wissenschaft.*, No. 20, 1868. D. F. C.

46. *Obstruction to Delivery Caused by Dorsal Displacement of the Arm.*—Dr. ANGUS MACDONALD read before the Edinburgh Obstetrical Society two cases of

this kind. Sir James Y. Simpson was the first to point out the true nature of these cases, and Dr. Macdonald believes with that eminent practitioner, that such cases are not nearly so rare as is commonly believed. He is also "strongly inclined to believe," with him, "that minor displacements of the arm are very frequently the cause of lesser degrees of obstruction to delivery. On Tuesday eight days (19th May), I was hurriedly sent for by a student to see a patient, a multipara, who had been some ten hours in the second stage of labour, and on my arrival, feeling convinced that the natural efforts would suffice to effect delivery, I merely waited a little till this took place. But as the head was advancing towards the outlet I felt the fingers of the right arm firmly impacted against the left side of the neck between the left ear and shoulder; and on keeping the hand in this position till labour was completed, I found that the right arm was crossed over the upper part of the chest, and the forearm being obliquely impacted between the left ear and shoulder, the head and arm engaged in the pelvis at the same time, and thus accounted for the delay.

"Sir James, besides, states that he believes that the occurrence of this accident undetected explains many cases of difficult labour in which no disproportion existed between the head and the pelvis, and wherein the uterine pains were normal, more especially referring to a case of Dr. Campbell's in which he had to perform craniotomy after failing to deliver by forceps.

"As to the difficulty of the accident and the obstruction presented by it, either to delivery by forceps or to natural delivery the two cases I have just read are sufficiently conclusive. I have no hesitation in saying, that if such a case is allowed to go on unaided, judging from the extreme difficulty to cause the head to advance by traction, the patient is sure to die from rupture of the uterus or die undelivered.

"It seems to me also that, so far at least as the child is concerned, to attempt to deliver by forceps is equally objectionable, though not nearly so dangerous to the mother. The accident is, however, exceedingly easily put right if detected in time, and may be effected in either of two ways, viz., by podalic version, as Sir James Y. Simpson and Mr. Jardine Murray effected delivery in the case recorded by them, or by bringing down the arm by the side of the head and converting it into a case of head and arm. This is what Sir James did first in his case, though, to quicken the labour, as his patient was very much exhausted and the pains weak, he had afterwards recourse to podalic version. I consider, that, had it not been that, in my second case, the patient was so much exhausted from hemorrhage, etc., and that the pains were somewhat weak, the labour would have been quickly terminated by the natural expulsive efforts, it was so easily effected by means of forceps. But the difficult point in regard to the obstruction is the diagnosis; the difficulty in this respect is, however, infinitely diminished by the ease with which such manipulations as are necessary can be effected under chloroform—an advantage which is clearly pointed out by its illustrious discoverer. Once the diagnosis is made out, all difficulty is over, and I can recommend no surer means of avoiding mistakes in such and similar cases than a rule of practice recommended to me by Dr. Andrew Inglis, and that is, whenever a case is unnaturally prolonged and you can detect no cause, and the cervix is well dilated, chloroform the patient deeply, and pass the hand all round the head to see that no portion is impacted upon, or projecting unnaturally against, any part of the pelvis.

"I have never failed to regret exceedingly the disastrous result of my first case, and feel certain that the life of that child could have been saved had we only had forethought to suspect that this uncommon lesion was present. But such cases are peculiarly deceiving, they seem so natural in every respect. There seems nothing in such cases to warrant the operation of craniotomy, though this, among other means, has been recommended as the proper treatment."

Dr. Keiller regarded the chloroforming the patient in all doubtful cases "and then introducing the hand to ascertain the true state of matters, was of great importance, and he had long been in the habit of recommending this plan to his students. It is the only method by which an accurate diagnosis can be made. The fact of some obstruction taking place in the progress of labour in

women who had previously been delivered without difficulty should excite suspicion. In such cases as those related by Dr. Macdonald, the child's arm is generally bent at the back of the neck, and there is great difficulty in bringing it down. Dr. K. preferred turning to the forceps in these cases. Delay is fraught with great danger to the mother and child.

Dr. Burn said he had repeatedly met with similar cases, but had never experienced any great difficulty in getting the head through with the forceps. In such cases, he thought the fact of the head receding suddenly after a pain was a good diagnostic sign.—*Edinburgh Medical Journal*, August, 1868.

47. *Treatment of Puerperal Convulsions*.—Dr. J. G. SWAYNE comments on the unaccountable disfavour with which depletion, even in this disease, is now regarded by many practitioners. Dr. Swayne related a well-marked case in his own practice, in which the convulsions which had increased after delivery and after all the usual remedies, except chloroform, had been tried, were at once arrested by bleeding. He also cited similar cases occurring in the practice of Dr. Depant, of Paris, and Dr. Dyce, of Aberdeen. In one case related by the former, chloroform had been tried for four hours without avail before bleeding was had recourse to. Lastly he narrated a case from the practice of his brother, Mr. S. H. Swayne, in which bleeding was attended with a like success, and followed by a marked diminution in the quantity of albumen in the urine within a very few hours. Dr. Swayne regards bleeding as the most important remedy of all, especially in these convulsions which have a centric origin.—*Brit. Med. Journ.*, Aug. 8, 1868.

48. *Asphyxia in a New-born Child, produced by Congenital Struma*.—In the *Monatsschr. f. Geburtskunde* (199, 1868), Dr. C. HECKER reports that a woman, 36 years old, labouring under well-marked scrofulous symptoms, gave birth, in her fourth labour, after five and a half hours' suffering, to a strong and heavy (seven pounds in weight) boy, who, after a few strong respiratory movements, suddenly expired. The death was the result of an enormous scrofulous enlargement of the glands situated along the trachea; in consequence of which enlargement the respiratory tube became flattened, and its cavity, to a great extent, obliterated, thus cutting off the access of air to the lungs.—*Centralblatt f. d. Med. Wiss.*, No. 19, 1868.

49. *Transfusion and a New Mode of Management*.—Dr. J. BRAXTON HICKS, in a paper read before the British Medical Association, remarked upon the small extent to which transfusion had spread, the various causes of which he then proceeded to consider: 1. The want of success generally, which was accounted for by the impossibility of having the apparatus always at hand, the tendency to postpone the operation till too late, and the difficulty of knowing the exact time at which to operate. 2. The inherent impediments to it from the position of the patient, and the tendency of the blood used to coagulate: this the author considered the most troublesome and dangerous, as a clot might readily be driven into the system. This Dr. Hicks had now overcome by the employment of a solution of phosphate of soda mixed with the blood of the supplier whilst flowing. He had first tried it on the lower animals, and then in three cases in the human female during delivery. It had simplified the operation to a great extent. The solution is well known to be tolerated by the system.—*Brit. Med. Journ.*, Aug. 8, 1868.

50. *Treatment of Versions and Flexions of the Uterus*.—Dr. GRAILY HEWITT described, at the late meeting of the British Medical Association, the various methods of treatment he had employed, and exhibited a complete series of instruments devised for carrying out the objects in view. The principle insisted on was the preservation of the vagina in its proper position, and making this the fixed point from which to operate on the uterus. In the first place was exhibited a series of eight oval rings of various sizes for the treatment of retroflexion of the uterus, also available for prolapsus. The rings were of copper wire covered with gutta-percha. They were modifications of Hodges' pessary.

In the next place, he showed a stem pessary of peculiar construction, intended for chronic and more difficult cases of retroflexion. For the treatment of ante-flexion and anteversion a series of pessaries of novel construction were shown, termed by Dr. Hewitt "cradle" pessaries, and designed to support the fundus uteri by means of two crutch-shaped projecting portions. The pessary was a ring bent into the necessary shape, and of various sizes. This pessary the author had used with uniform success for a period of two years, and stated that by its means the uterus could be held in almost any required position when inclined forwards abnormally. He had found it a most valuable invention, and it had been the means of relieving patients of most distressing and troublesome symptoms. Next were exhibited a series of stem ebonite pessaries, to be worn in the cervical canal. These were retained there by a ring; and the two parts were connected by a simple arrangement. These were used in cases of ante-flexion where the flexion was troublesome and chronic.—*Brit. Med. Journ.*, Aug. 8, 1868.

51. *Local Use of Perchloride of Iron in Uterine Affections.*—The objection to perchloride of iron as a topical application in diseases of the womb and uterine passages is, that this salt, unless very much diluted, corrodes the epithelium of the mucous membrane lining the vagina. To prevent this corrosive action, which is caused by the presence of free hydrochloric acid, Dr. BRAUN adds carbonate of soda to a solution of the perchloride of iron, and converts the latter into a neutral salt. For this purpose, the addition of four grains of crystallized carbonate of soda to one ounce of the liquor ferri perchloridi will generally suffice. Chloride of sodium is formed; but the hæmostatic properties of the perchloride are, Dr. Braun states, intensified rather than diminished by the alteration. Dr. Braun has used concentrated solutions of the perchloride treated as above, in various affections of the uterus, and with very good results. In cases of endometritis, hemorrhagia, and of bleeding from small fibrous tumours, he dilates the cervix uteri by sponge-tents, and injects a small quantity of the liquor ferri into the cavity by means of the uterine syringe. For puerperal metrosepsis and putrid vaginal discharges, from one-half to one ounce of the solution is injected by means of an elastic ball fitted to the end of a catheter. To lesions about the os and cervix uteri, Dr. Braun applies balls of compressed cotton-wool completely saturated with a strong solution of the perchloride.—*Brit. Med. Journal*, March 14, 1868, from *Wein. Med. Woch.*, No. 57, 1867.

52. *Treatment of Intra-uterine Polypi.*—Dr. GEORGE H. KIDD observes that we are indebted to Sir James Simpson's application of sponge-tents for the dilatation of the uterus for being able to detect or treat intra-uterine polypi; but sponge-tents, it is shown, are liable to many objections. They become very fetid when they have been a few hours in the uterus; they require prolonged and repeated applications before they open up the canal of the cervix to allow of a complete exploration of the uterus; and they dilate the os externum to an unnecessary degree before they act on the os internum; and their use may give rise to so much irritation as to be attended with fatal consequences. Instead of sponge, Dr. Kidd recommends the use of sea-tangle, with pieces of which, sufficiently long to traverse the whole cavity of the uterus, and of about the size of a No. 5 or 6 bougie, he fills the canal of the cervix as completely as it can be done without using force or causing pain. If the os should be abnormally small, it might be necessary to introduce a single tent for a few hours, as a preparation for more full dilatation; but in general the parts are so relaxed by the hemorrhage from the polypi, that five or six or more pieces can be introduced at the first attempt; and this is found sufficient to permit of a full exploration of the uterus, and the removal of any polypi found in it. For extracting the polypi, the use of a single wire *écraseur* is found the most certain and simple method. The tumour is seized in a vulsellum, guided to it by the finger on the uterus; and then the loop of the *écraseur* is guided to it by the vulsellum, and adapted round its neck by the finger, when tightening the screw divides the attachment of the tumour, allowing it to be extracted along with the vulsellum by which it had been seized. Dr. Kidd stated that he had operated in this way on very

many cases during the last three years, and had always found it safe and efficacious; and he concluded by exhibiting twenty-nine fibrous polypi that he had removed in this way from the interior of the cavity of the body of the uterus of an unmarried woman aged 56, at four operations; three being removed in the first operation, in September, 1867; nine in the second, in March, 1868; eleven in the third, in May; and six in the following July, when the interior of the uterus was freely painted over with strong nitric acid, with the hope of preventing their further growth; and, for so far, with good effect. The tumours were found, on microscopical examination, to be simply fibrous, differing in this respect from the recurrent fibroid tumours described by West and others; and Dr. Kidd stated that he believed the case to be unique in the annals of medicine.—*Proceedings of Brit. Med. Ass., in Brit. Med. Journ., Aug. 8, 1868.*

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

53. *Toxicological action of Prussic Acid; Atropia as an Antidote.*—M. W. PREYER has arrived at the following most important conclusions from a series of ingenious arguments and experiments. In comparatively moderate, but yet fatally poisonous doses, prussic acid acts by very suddenly and completely depriving the blood of its oxygen. The phenomena being only an exaggerated and intensified representation of what occurs when an animal is made to breathe unmixed hydrogen for some time. Supposing the poisoning to have been accomplished, then, by a comparatively moderate dose, resaturation of the blood with oxygen, if it can be quickly enough accomplished, will infallibly restore the animal to life. On the other hand, prussic acid, given in *very large* doses, paralyzes the heart, and is absolutely fatal. Those cases in which there is apnœa, and the heart is beating, remain open for treatment. M. Preyer was led to believe that the true physiological antidote for prussic acid was an agent which (without producing any other important poisonous effects) would paralyze the peripheral branches of the vagus in the lungs and in the heart; and, on the other hand, stimulate the central nervous apparatus of respiration in such a manner as to produce rapid respirations. He now makes the very important announcement, that sulphate of atropia acts precisely in this way, and he has demonstrated on rabbits and guinea-pigs, that the subcutaneous injection of a very small dose of this agent, if performed pretty quickly after the injection of the prussic acid, is an *unfailing antidote*. Apparently he would recommend the injection of quite small doses ($\frac{1}{7}$ th grain?).—*The Practitioner*, August, 1868.

54. *Poisoning from Eating Bread containing Ergot.*—Dr. FLINZER (*Von Horn's Vjschr. f. Gess. Med.*, viii., 1868) states that the entire family of a farmer, consisting, with his labourers, of over ten persons in all, after partaking of bread containing a large portion, say one-tenth, of ergoted rye, sickened. The symptoms were at first debility, giddiness, and loss of appetite; subsequently were added a feeling of distress, a creeping sensation in the hands and feet, tonic contractions of the extremities, profuse sweating, great thirst, and diarrhœa. A pregnant female was brought to bed five weeks before her proper time. Two of the patients died, but the fact became known too late to allow of an autopsy being made.—*Centralblatt f. d. Medicinisch. Wissenchn.*, 1868.

D. F. C.

55. *Experiments with the Poison of the Cobra di Capella.*—Dr. JOHN SHORTT, of Madras, has published (*Lancet*, May 2d and 16th), an account of a number of experiments made by him on this poison.

A review of all his experiments leads him to conclude that the effects of the cobra poison observed in mammals and birds are the following:—

“The poison injected having found its way into the circulation, restlessness,

dulness, drooping of the head, and jactitation follow successively. The restlessness and change of position of the animal are constant. The bowels are evacuated, and the urine is passed. The pupils act irregularly, dilating or contracting. Respiration is slow and irregular, at times stertorous, with foam or frothy mucus issuing from the mouth, spasms, and muscular twitching. Reflex action is arrested, as the animal cannot be roused by pricking or pinching the skin. Consciousness and ocular recognition continue to the last in most instances; sensation is retained, though modified; whilst the paralysis is incomplete. The voluntary movements, sometimes after becoming more energetic, soon cease altogether; and the animal may die without the slightest trace of convulsion or tetanic spasms. When the poison has been rapidly absorbed, its effects become apparent more quickly; and the venom is readily absorbed by any living tissue.

The post-mortem examination discovers the right side of the heart to contain some tarry-looking, black, soft clots of blood; and the left side empty. The entire venous system is engorged with the same kind of blood, more especially the large venous trunks. The liver is found hyperæmic, enlarged and dark-coloured.

The first effect of the poison in the system seems to me to damage the current of blood, by the cells of the poison perhaps deranging the vital affinities existing between the blood-corpuscles and the serum in which they float, and by that means the nervous centres are affected and nutrition arrested. On life becoming extinct, the pupils remain permanently dilated, and the blood found in larger vessels, when removed from the body, coagulates within four or five minutes after death. Rigor mortis absent, the limbs remaining supple for hours after life becomes extinct, except only in a few instances, when it occurred in a couple of hours.

HYGIENE.

56. *Air of Hospitals, in reference chiefly to the Presence of Microscopic Germs.*—Mr. LUND, of Manchester, in a paper read before the British Medical Association (*Lancet*, Aug. 15, 1868) detailed some experiments which he had made on the air in one of the surgical wards of the Manchester Royal Infirmary. The ward in which the experiments were conducted contained four beds, and had a cubical capacity of about 5400 feet. A fluidounce of distilled water was placed in a pint stoppered glass bottle, and by removing the stopper, raising the bottle sharply through the air, reclosing and quickly shaking it, the water and the air were intimately mixed; and this process was repeated in all fully 500 times, until the water, previously transparent, had become slightly opalescent. In the deposit thus thrown down, after forty-eight hours, distinct evidences of the presence of organic life were perceptible under the microscope, and on the fifth day there were numerous actively moving vorticelli, with abundance of monads in ceaseless motion. From this it was inferred, if the same experiments were repeated under more varying circumstances, it might be shown that the presence, in the air, of microscopic organic germs was a constant condition easily detectible. The simplicity of the experiment, and the evidence derived from it, attracted much attention.

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

On Carbolic Acid in the Treatment of Boils, Whitlows, and Abscesses.
By C. J. CLEBORNE, M. D., Surgeon U. S. N.

As carbolic acid is exciting so much attention at the present time, I will give my experience with that article in the treatment of whitlows, boils, and abscesses. During the past year I have had an unusually large number of these cases on board ship, and being dissatisfied with the usual mode of treatment, I determined to try the effect of carbolic acid. This I did by making a free opening so soon as fluctuation could be detected, and when all of the pus had been discharged by gentle pressure, I either injected or swabbed out the cavity with the ordinary liquid carbolic acid of the shops, after which I applied a cold water-dressing. By this treatment further suppuration was prevented, and the wound healed so rapidly that the patient returned to duty in two or three days.

In some cases, after evacuating the pus, and using the acid, I drew the edges of the wound together with isinglass plaster, and in twenty four hours it entirely healed. My experience, so far, has been with ordinary *undiluted* liquid carbolic acid (not carboline), and the results have been so satisfactory that it deserves a trial in similar cases. In the treatment of gonorrhœa, I have not been satisfied with the liquid carbolic acid. As an injection it caused too much pain, and seemed to aggravate the symptoms when used even in the proportion of two to five drops to the ounce of water. These objections, it is said, do not apply to the crystallized acid of Merck, or the chemically pure article of Calvert, which may be used for this purpose in the proportion of two to five grains to the ounce of oil of almonds, or diluted glycerine.

U. S. SARATOGA, July 29, 1868.

Tetanus following Amputation of Forearm successfully treated by Bromide of Potassium. By HENRY F. ANDREWS, M. D., Washington, Geo.

July 16. I amputated the forearm of a negro man, æt. about forty, on account of an injury from a threshing machine, crushing right hand and wrist, about three inches above the wrist-joint. The case did very well until August 9. On the 10th of August I was sent for, when he had well-marked tetanus. He stated that he had been suffering for several days with pains, though not severe, through the chest. On the 9th tetanic spasms came on, from which he suffered much, and had slept little or none the night previously. His jaws were almost immovable; great muscular rigidity, especially in the muscles of the abdomen, neck, and back; pulse about 100; skin bathed in cool perspiration; tongue furred; bowels constipated. The spasms were frequent, violent, and accompanied by a slight bending of the body backward. The stump had united perfectly, except at the point where the ligatures passed out. I made considerable traction on the ligatures to remove them, but failed. Ordered the bromide

of potassium, thirty grains, to be repeated in doses of twenty grains every two hours.

August 11. Much relieved; had no spasms during the night; slept several hours; spasms returned an hour or two before my visit, but they are not so violent, and the intervals between them are much longer; is very drowsy, falls asleep occasionally between the paroxysms. Directed the bromide to be given every three hours; ligatures still immovable.

13th. Very great improvement; is sitting up; has had no paroxysm since the evening of the 11th; has slept a great deal, and feels very drowsy all the time; has had a small action from bowels; still some muscular rigidity remaining. Removed the ligatures, though with considerable difficulty, and a slight paroxysm occurred while making traction on the ligature around the radial artery. Directed the bromide every four hours, but if the spasms return, to take it every two hours again.

14th. Still improving; sleeps well; appetite good; has had two healthy actions from bowels in the course of the day. Bromide to be given at still longer intervals.

17th. The only evidence remaining of the disease is some muscular soreness, and a slight stiffness about the jaws; has had two actions daily since the 13th. Directed the bromide three times a day for a few days longer, unless there should be a return of the symptoms, in which case it is to be taken as at first.

He steadily improved, and at present, August 23, has not a symptom of the disease. I think it probable that the ligatures remaining so long was the exciting cause of the disease, and that they were probably not drawn sufficiently tight at the time of the operation.

Case of Traumatic Tetanus; Recovery. By HENRY L. BURTON, M. D., of Somerville, Fayette Co., Tenn.

Feb. 9, 1868. I was called to see a large muscular negro man, of good constitution, æt. about 45, who had been wounded a few hours previously by the bursting of a shot gun. The thumb of the left hand was dreadfully lacerated and torn up to the articulation of its metacarpal bone with the trapezium, a portion of which was also broken off; skin and fascia of almost the entire back of the hand torn up and hanging by a narrow strip; hemorrhage very slight. The thumb was removed, and the edges of the wound, after thorough washing, brought together as well as its ragged nature would admit, secured by sutures, adhesive strips and bandage, and cold water with a little laudanum applied. Morphia was given to quiet restlessness, and magnesia sulph. to open the bowels when necessary. The wound did remarkably well, except some little sloughing with very fetid discharge, which was counteracted by dressings of sol. chlorin. soda, and the patient seemed in good condition generally till March 5, when I was sent for in great haste to see him, and found him leaning against the side of his bed, bathed in profuse perspiration, with a countenance indicative of intense agony; tetanic spasms recurring every few minutes, and with such intensity when he attempted to move, that it was with great difficulty I could get him to change his position. He complained of very great pain in the left groin, from which point he said all of his spasms seemed to start, the "cramps" extending thence upward, over the entire abdomen, and downward into the lower extremities. There was tonic contraction of all the abdominal muscles which were hard and knotted; pulse, 128.

He informed me that he had had some slight cramps for a day or two, but took little notice of them until about 11 o'clock on that day (5th), when he was seized, while sitting up, with severe pain in his groin, which soon extended, with violent cramps, to the entire body, drawing him forcibly backwards. I was informed by my friend, Dr. R. H. Harvey, who was on the place at the time, and kindly called in to see the patient, that there was decided opisthotonos in this attack. He administered chloroform, which relieved the paroxysm, and the patient slept for an hour or two. On awaking the spasms returned, but only involved the abdominal muscles and legs as described above. His bowels had become very much constipated; had taken a large dose of oil and turpentine nine hours before my visit without effect. I administered a large enema, which came away without any fecal matter. Ordered cloths wrung out of hot water to be applied to the abdomen, and gave calomel, gr. xij; jalap, gr. xv; tart. ant., gr. j, with a liberal dose of morphia to be taken soon afterwards.

March 6. More quiet; had had two free, dark, and offensive actions from bowels, and slept some in latter part of night. Abdomen still rigid and knotted, but less cramp in the legs; respiration natural and easy; pulse 88; repeated calomel and jalap $\bar{a}\bar{a}$ gr. x, with tart. ant. gr. j, and ordered morphia, gr. $\frac{1}{3}$, with $\frac{1}{4}$ gr. of tart. ant., to be given so as to keep patient steadily under influence of the opiate. Wound not painful, but dry; warm water-dressings to restore suppuration. From this time until March 10, there was some diminution in the force and frequency of the paroxysms, and the patient rested tolerably well at night; but there was very little relaxation of the abdominal muscles. The morphia had been regularly continued, with occasionally calomel and tart. emetic; bowels kept in good condition, and wound suppurating more freely. On the 10th applied a blister to almost the entire length of the spine, hoping for some benefit from counter-irritation. Up to 3 P. M. of the 12th there seemed to be a considerable change for the better; paroxysms rarely coming on, except when he attempted to change his position, when light spasms seized him. Bowels had again become constipated, for which he had taken oil and turpentine at 12 M. on the 12th, and he was ordered to take 10 grs. each of calomel and jalap at bedtime, if his bowels should not be moved; morphia continued. At 11 P. M. I was called in haste to see him, and found that he had had another severe paroxysm about 10 o'clock, which lasted nearly an hour, with very slight remissions, but finally yielded after taking liberal doses of morphia at short intervals; bowels not moved for thirty-six hours; abdomen very rigid; paroxysms short but frequent; pulse 110. Administered enema of turpentine, which produced one good action, and gave $\frac{3}{4}$ gr. of morphia, and ordered the dose repeated so as to keep him fully under its influence.

13th. 7 A. M. Patient resting quietly; had slept some in latter part of night, and paroxysms were much diminished in frequency and force; pulse 90; bowels not moved since action from enema; ordered calomel and jalap, 10 grs. each, and continued the morphia, with calomel 2 grs. and tart. ant. $\frac{1}{4}$ gr., every three hours; wound looking well; warm water-dressing continued, and touched it freely with argenti nit.

15th. Some improvement; paroxysms not so frequent; bowels in good condition; pulse 94; respiration natural. But there is still a good deal of rigidity of abdominal muscles, and tendency to cramp in lower ex-

tremities excited on the slightest motion; wound suppurating freely. Continued morphia and calomel, and reapplied blister to spine.

16th. Had a good night's rest, and is nearly free from paroxysms; bowels moving rather freely; pulse 112. Wound doing tolerably well. Left off calomel and continued morphia. Dr. Harvey saw the case with me this morning, and suggested the poultice with laudanum, instead of the warm water-dressing to the wound.

17th. Entirely free from spasms, except that some rigidity of abdominal muscles still remains; bowels moving so freely as to call for use of opium and sugar of lead, which soon controlled them. Pulse this morning only 90, notwithstanding violent disturbance of bowels.

18th. Entirely free from spasm; good deal of soreness in the muscles, that have been involved with some contraction of abdominal muscles on pressure. From this time on there was a steady but gradual improvement, and the patient made a good recovery.

During the progress of this case there was never any pain in the wounded limb, the patient referring to the left groin as his point of greatest suffering, and the starting point of all his paroxysms. The pulse varied from day to day, from 80 to 128 beats to the minute, without any apparent corresponding change in the general condition of the patient.

April 15, 1868.

Case of Gunshot Wound of the Chest. By D. N. RANKIN, M. D., Physician to Western Penitentiary of Pennsylvania.

About half-past seven o'clock P. M., January 1, 1868, I was hastily summoned to see Charles B., aged twenty-one years, in sound health and of robust constitution, who had, about half an hour previously, received a pistol-shot wound, the ball entering the side of his chest, between the second and third ribs. The shock almost immediately prostrated him, and his system did not fully react until the following morning. Dr. Alcorn, who resides in the vicinity, was called in. We had him raised to the semi-erect position, which he had been occupying when the injury was received. Upon a careful examination it was discovered that the ball had entered the chest at a point about two inches below the left axilla, between the second and third ribs, passed through the pleura costalis, and, we presumed, was located in the cavity of the pleura; for if it had wounded the lung itself, it would have produced collapse of that organ, expectoration of bloody, frothy, exudation, etc. and considerable cough, all of which were absent; but he complained of considerable pain in the left diaphragmatic region. The wound was at once closed with a compress and bandage, and a tablespoonful of brandy, and a teaspoonful of laudanum, exhibited every half hour, to be continued until reaction should take place; at the same time the usual means for bringing about reaction were used externally, with vigour. Next morning violent reaction had taken place; pulse 130 per minute, full and bounding; hot skin, with considerable pain in the side, and cough. We bled him from the arm to the amount of twenty ounces, and prescribed: R. Hydrarg. chl. mite gr. x; pulv. Doveri gr. xv. M. div. in pulv. v. S.—one to be taken every three hours, and, four hours after the last powder, three compound cathartic pills. Also, R. Tr. verat. viride, syr. scillæ, āā ʒss. M. S.—ten drops every two hours. At 5 P. M. his pulse was reduced to 90, soft, and com-

pressible; skin moist, pain less severe; some nausea. *Tr. digitalis*, in doses of fifteen drops, was substituted for the *verat. viride* and squills, with very good effect.

At 9 o'clock A. M. on the 3d inst. we found him comparatively comfortable, the pulse being reduced to 80 per minute; skin moist; tongue clean; not much pain, unless he takes a deep inspiration. At 9 A. M. of the 4th inst., at the request of the family, I brought Dr. Trevor to see the case with Dr. A. and myself, and at my own suggestion we turned the case over to Dr. Trevor, he being the regular family physician. I did not see the case again, but was informed by Dr. Trevor that not a single bad symptom had made its appearance since the 4th inst., and that the patient was able to resume his employment as a plumber, in ten or twelve days after the reception of the accident.

ALLEGHANY CITY, PA., April 9, 1868.

Case of Puerperal Eclampsia. By O. POMROY, M. D., of Chardon, Geauga Co., Ohio.

February 8, 1868, 4 P. M., was called to see Mrs. H., aged 17, primipara. Found her unconscious, breathing stertorous; had convulsions since 8 o'clock in the morning, in all twenty-seven, the longest interval being twenty minutes. The physician in attendance stated that labour had not advanced since the first convulsion, and that his treatment had consisted in pouring a little ether on patient's head and the administration of some sanguinaria and lobelia by the mouth, of which she had swallowed but little. Pulse 120, small and hard; head hot; pupils much dilated and insensible to light. I opened a vein in left arm and took ℥vii when the blood ceased to flow and she went into another convulsion, which lasted about five minutes. As soon as the circulation was sufficiently re-established, I opened a vein in the right arm from which ℥xxiv was obtained, with the effect of softening the pulse and improving her respiration. Ordered head to be packed in bags of snow, and administered at once the following: *R. Tinct. veratri viridis* gtt. xv, water ℥j , which I succeeded in getting her, with much difficulty, to swallow. In thirty minutes, from the last she had another fit, which was much lighter, lasting only about one minute. On examination found the os dilated to the size of a half dollar and very dilatable; administered ℥ij wine of ergot. The presentation was in the first vertex position. At 55 minutes from the last convulsion, she had another very slight one, which was the last. Labour-pains came on quite vigorously, and she was delivered at the end of two hours of a stillborn well-developed male child; the placenta followed in 15 minutes; uterus contracting; no hemorrhage; respiration has improved since last fit, and now breathes quite naturally; has nausea, and has vomited some; is still unconscious and very restless, throwing herself about violently; I ordered the following: *R. Morph. sulph. gr. ij, ipecac gr. viij. Divide into 8 powders. S.—Take one every hour until more quiet, and then extend the time to four or five hours.*

9th. 11 o'clock A. M. Still unconscious; had been restless nearly constantly since I left in the night, and had slept but little; had been feverish. Pulse 110; pupils yet much dilated, and insensible to light; head hot. Ordered her head to be placed again in the snow and the following to be given: *R. Verat. virid. gtt. xxx, aquæ ℥vj. ft. mist. Sig. ℥j every three hours. Also, R. Acetat. potassæ ℥iv; syrup. simpl. ℥ij.*

Misce. S.—A dessertspoonful every four hours, alternating with the above.

10th. 10 o'clock A. M. Still unconscious; pupils yet insensible to light and dilated. Urine has been voided in bed and quite profusely. Pulse 60, soft; skin cool and pleasant; head cool; discontinued the snow; continued the other treatment.

11th. 10 o'clock A. M. More conscious this morning; says she can see a little, but everything looks misty. Speaks rationally for the first time; got her to protrude her tongue; it is much swollen and badly lacerated, covered with a thick yellow fur; was somewhat delirious during night. Pulse 60; skin pleasant; head cool; lochia, which has been suppressed, is now natural. Ordered an enema and continued treatment.

12th. 10 o'clock A. M. Has been more comfortable since last visit; Slept much last night, has some appetite; has not inquired for her child; was asked if she knew that she had been confined; said she did not know anything about it, but supposed she had been. Pulse 100, and rapid. Breasts tender, bowels have acted twice freely. Continued treatment with slight increase of the verat. virid. Has had no nausea since the first night of sickness.

13th. 10 o'clock A. M. Feels much better, passed a comfortable night. Pulse 112, and weak; milk secretion established. Discontinued the veratrum and substituted whiskey 3j, each hour; continued potassa.

14th. Same as yesterday; passed a good night. Pulse 112. Continued whiskey; left off potassa and substituted the following: R. Quiniæ sulph. gr. viij, pulvis opii gr. ij. Misce, and make 8 powders. S.—One every four hours.

19th. Convalescent; feels much stronger to-day. Continued treatment. Appetite good.

20th. 5 o'clock A. M. Was called in great haste; found her much prostrated; had not slept any during night; was taken about 10 P. M. with diarrhœa, accompanied with tormina and tenesmus; bowels had acted fifteen times during night. Pulse 128, small, frequent and weak; had had several attacks of syncope; feet cold; skin relaxed and perspiring. Ordered whiskey 3j, each half hour, also the following: Opii pulveris gr. $\frac{1}{2}$, quiniæ sulph. gr. ij, to be taken every three hours.

5 o'clock P. M. Has slept none during day; bowels have not acted since visit in morning; is quite restless; wants to talk all the time; is a little inclined to delirium at times. Pulse 120, rather more full than in morning. Continued treatment. At 10 P. M. was called again. Had had a chill; was sweating profusely; had slept none; was very restless. Pulse 140, small and weak. Increased stimulants and anodynes.

21st. 8 A. M. Slept some after midnight; feels more comfortable this morning; sweating less profuse. Pulse 130, more full. Procured a better article of whiskey, and ordered 3ij each half hour; continued quinia and opium, gr. ij of the former and gr. $\frac{1}{4}$ of the latter. 4 o'clock P. M. Is much more comfortable; slept considerable; has had no fainting spells since change of stimulant. Pulse 112, quite full; does not sweat much. Continued treatment.

22d. 10 o'clock A. M. Better. Pulse 100, full and regular; does not sweat at all; skin cool and pleasant. Treatment continued.

24th. Is gaining strength; tongue begins to clean. Pulse soft and full,

100 ; rests well at night ; convalescence is becoming established. Continued treatment.

26th. Improving ; tongue has cleaned. Pulse 85, full ; bowels have not acted for three days. Ordered oil ricini ʒj, to be taken at once and repeated if necessary. Continued stimulants and tonics.

29th. Is much better, bowels acted twice from the oil. Pulse 75 ; appetite better ; is gaining strength, but cannot sit up yet.

March 5. Is gaining strength fast ; can sit up an hour at a time. Ordered quinia gr. ij, whiskey ʒij, three times a day.

April 1. Well and able to attend her household duties.

Treatment of Fractures by Extension by Means of Weights and Pulleys.—Several surgeons have of late laid claims to having devised this method, which, however, seems to be as old as Hildanus, who describes (*Opera*, p. 47) an apparatus for that purpose. It is but justice to our former contributor, Dr. WILLIAM C. DANIELL, then of Savannah, Geo., to call attention to the fact that he employed it half a century ago ; so that he has precedence of all modern claimants. In a paper in this Journal (vol. iv. p. 330) he relates two cases successfully treated by him by this method, one in 1819, the other in 1824, and figures the apparatus which he devised. We have reason to believe that Dr. D. never saw Hildanus' work, and that the method was the offspring of his own ingenuity.—ED.

Gunshot Wound Healed by the First Intention. By WM. M. FINDLEY, M. D., of Altoona, Pa.

Having noticed in the *British and Foreign Medico-Chirurgical Review* for April last, page 512, an account by Prof. Simon of the healing of penetrating wounds (gunshot) by the first intention, it has appeared to me that the following case of gunshot wound involving both bone tissue and soft parts, which was followed by the same result, may be worth recording :—

Mr. A. K., German, middle aged, good health, in handling a small pocket pistol, which he did not know was loaded, accidentally discharged one barrel, the ball, called by sportsmen a double B, passed directly through from the palmar to the dorsal surface of the proximal phalanx of the little finger on the right hand, lodging somewhere in the room. The wound was compound and comminuted, both ; the phalanx being broken off and each fragment split up some distance ; very little hemorrhage ; no vessel of any importance was wounded. Saw it immediately, and ordered warm water dressings, which were kept constantly applied for some ten days. It progressed favourably, and the external wound cicatrized, and during the entire time neither myself nor the gentleman saw one drop of pus or any discharge, except a little blood the first day or two. This occurred in April last, and at the present writing the finger is "as good as ever," he says, except that it is about one-third thicker than the corresponding one, but the excessive callus is being rapidly absorbed. The joint between the first and second phalanges is somewhat stiffened.

DOMESTIC SUMMARY.

Placenta Prævia.—The *American Journal of Obstetrics* for May last contains an account, by Prof. T. G. THOMAS, of eight cases of this accident, which,

according to Sir James Simpson, causes a mortality of one-third of the mothers and over one-half of the children.

The reasons of this great mortality Prof. Thomas believes to be :—

"1st. The dilatation of the cervix for the passage of the child unavoidably exposes both mother and infant to great danger from placental detachment and hemorrhage.

"2d. Repeated hemorrhages occurring during the ninth month, as the os internum dilates under the influence of painless uterine contractions, which then occur, the woman at the time of labour is usually exsanguinated, exhausted, and depressed both physically and mentally.

"3d. Profuse flooding generally occurring with the commencement of labour, the medical attendant is often not at hand, and reaches his patient only after a serious loss of blood has occurred.

"The dangers attendant upon the condition develop themselves most markedly in the first stage of labour, and death not infrequently occurs before the os externum is dilated to a size not greater than a Spanish dollar. At this time surgical interference, if resorted to to accomplish delivery, often destroys the lives which it is intended to save. The hand forced too soon through a rigid os will often rupture its walls, while a delay without the adoption of the means capable of controlling hemorrhage will necessarily favour the occurrence of a fatal result.

"On the other hand, should full dilatation of the os have taken place, and the patient be exhausted from sanguineous loss, the practice of rapid artificial delivery will not rarely be followed by fatal prostration."

Prof. T. is convinced that when it becomes the recognized practice to resort to premature delivery as a prophylactic measure in these cases that the mortality will be diminished. "By resorting to this measure," he says, "we should be dealing with a woman who is not exhausted by repeated hemorrhages; the obstetrician would be in attendance at the commencement of the labour; and he would be able by hydrostatic pressure to control flooding, while the same pressure accomplished rapidly and certainly the first stage of labour.

"When this step has not been deemed advisable, or from any cause labour has absolutely set in complicated by unavoidable hemorrhage, there are two plans by which we may endeavour to save the lives of mother and child.

"1st. We may alter the state of affairs at the cervix so that dilatation may occur without hemorrhage.

"2d. We may hasten the delivery of the child so as to render a *gradual dilatation* of the cervix unnecessary.

"The means at our command for accomplishing these indications may thus be tabulated and presented at a glance :—

"*Means for preventing Hemorrhage while the Os dilates.*—1. Distension of cervix by bags of water; 2. Evacuation of liquor amnii; 3. Partial detachment of placenta; 4. Complete detachment of placenta; 5. The tampon or colpeurynter.

"*Means for hastening Delivery of Child.*—1. Ergot; 2. Version; 3. Forceps; 4. Craniotomy."

Acupressure and its Effects.—Dr. HUTCHINSON presented to the New York Pathological Society, January 22, 1868, some specimens illustrating the effects of acupressure on the arteries of sheep, dogs, and men, and remarked that "these specimens, in company with those presented at a previous meeting, comprise my experience with acupressure. It has been employed in twenty-eight arteries in man and five or six in the lower animals. Among other operations in which it was employed were, two amputations of the leg, one at knee-joint and one of foot, and one of wound in the radial artery—which latter, by the way, illustrated the value of acupressure in a striking manner. The patient had suffered from an extensive lacerated wound in the lower part of the forearm and hand, and, several days after, sloughing took place followed by hemorrhage from the radial artery. The bleeding was very profuse, so much so that the patient lost a pint and a half of blood in a very few minutes. The artery was exposed in the midst of sloughing tissue. The tourniquet had been applied and also the persulphate of iron; these

were, however, removed and acupressure needles slipped under the artery above and below, with the effect of arresting the hemorrhage in an instant. The needles were removed at the end of twenty-two hours. The following day the patient had hemorrhage from the superficialis volæ from the same cause. The blood oozed out very freely, and a considerable quantity was lost before the house-surgeon could arrive to arrest it. This Dr. Eldridge did by the method of acupressure with a very satisfactory result. This latter needle was removed at the end of twenty-seven hours. These two cases illustrate very strongly the value of acupressure in certain cases. I believe that if a ligature had been applied premature sloughing might have resulted, with its attendant hemorrhage. In either case, in order to prevent this occurrence, it would have been necessary to have applied a ligature in sound tissue above and below the wound, to have made a very long, tedious, and unsatisfactory dissection, with the result, as before stated, of having secondary hemorrhage afterwards.

"The value of acupressure is, of course, not fully known. Yet it has been demonstrated that we can by these means certainly arrest hemorrhage. I am disposed to think that secondary hemorrhage is less apt to occur after it than after ligature. It is very well known that secondary hemorrhage, from some peculiarity of the constitution, does not form a firm enough clot before the ligature separates. Then, again, it occurs as the result of ulcerations of the arteries prematurely and from sloughing, which not infrequently extends beyond the seat of the plug. By means of acupressure we simply compress the coats of the artery together; no violence is used, the coats are not disturbed at all, and there is on that account less liability to secondary hemorrhage."—*The Medical Record*, May 1, 1868.

Pathology and Treatment of Croup.—Dr. A. JACOBI, in an elaborate article (*American Journal of Obstetrics*, May, 1868), states that he has performed tracheotomy for croup on 67 children, of which 13 recovered. 38 of these were on boys, of whom 8 recovered; and 29 on girls, of whom 5 recovered; giving a percentage of recoveries of $19\frac{1}{2}$ per cent. This mortality appears, he says, more unfavourable than it really is, as five of the operations were made on individuals who were either dead or dying, and in whom the indication for an operation had passed by. Deducing these, the recoveries would be 13 out of 62 operations, or 21 per cent.

Of Dr. J.'s patients, "one was of the age of 1 year 1 month; one, 1 year 3 months; one, 1 year 7 months; one, 1 year 10 months; five, 2 to $2\frac{1}{2}$ years; nine, $2\frac{1}{2}$ to 3 years; sixteen, 3 to 4 years; twenty-three, 4 to 5 years; seven, 5 to 6 years; two, 7 to 8 years; and one 10 years.

"Recoveries took place:—

1	at the age of $2\frac{1}{2}$ to 3 years,	1	out of 5 operations,	=	20	per cent.
3	"	3	" 4 " 1	"	16	" = 19 "
7	"	4	" 5 " 1	"	23	" = 30 "
2	"	5	" 6 " 1	"	7	" = 28 4-7 "

"The after-treatment in some of these cases was protracted, and therefore the tube had to remain in some a pretty long time. It was removed in two cases on the 17th day, one on the 18th, one on the 20th, one on the 27th, one on the 29th, one on the 30th, two on the 35th, one on the 42d, one on the 44th, one on the 46th, and one on the 54th day.

"The cause of the long duration of the after-treatment was in four cases of a peculiar nature. It was found that in the second week after operation, the larynx having expelled the macerated membranes, would resume its functions, and the patient breathe normally through the tube and its upper fenestra, and the larynx, the anterior opening of the tube having been closed by a cork. But the removal of the tube from the trachea gave rise to instantaneous attacks of dyspnoea and suffocation, which were instantly removed again by the replacing of the tube. This occurrence would take place so regularly, that the patients would not admit the removal of the tube afterward. The cause of this strange and unsatisfactory occurrence, was found to be the presence of polypoid excrescences, sometimes numerous, of the size of a pin's head to that of a pea and more, originating on

the margin of the tracheal wound, in one case on the lower portion of the sore larynx itself. It required a great many applications of nitrate of silver, or sub-sulphate of iron, to destroy them; their disappearance would instantly relieve the symptoms and allow of the final removal of the tube from the trachea."

Spontaneous Subsidence of an Ovarian Tumour.—Dr. SAMUEL MITCHELL, of Cameron Mills, New York, records (*New York Med. Journ.*, May, 1868) a very remarkable case under this caption. The subject of it was about forty years of age, with a tumour occupying nearly the whole abdominal cavity; multilocular and unusually hard. When first observed, about two years before, it was about the size of an egg, and situated in the region of the right ovary. There was and had been but little pain or tenderness; general health but little impaired. Dr. M. diagnosed an ovarian tumour, and in December, 1858, Dr. F. H. HAMILTON saw her in consultation, with the view of performing ovariectomy. "After a careful examination of the case, in view of the comparatively comfortable state of health of the patient, the inestimable value that a few years of life would be in rearing her family of little girls, and the great risk necessarily attending the operation, he decided not to operate. I have seen her occasionally since that time. There was a steady increase in size in the tumour until within the last two years. It got to be very burdensome from its great size and weight. The only way she could keep about was by wearing a strong bandage with shoulder-straps. She continued to have fair health, has never been tapped or taken any medicine for it. A few weeks since I met her in the street, not having seen her for nearly two years. She was so much diminished in size I was quite uncertain about her identity. I learned upon inquiry of her that she had ceased to menstruate within two years, since which the tumour had steadily decreased in size, and was now about the size of a small child's head, quite hard, and rather firmly fixed. She has no pain, and says she is well, and is doing her own housework. She added, 'Tell Dr. Hamilton I have lived to raise up my girls, and to see them happily married and settled in life, and I am feeling better than when he so mercifully spared me the operation.'"

Dislocation of the Hip-joint reduced by making the Femur a Lever acting upon a Fulcrum placed in the Groin.—Dr. GEO. SUTTON, of Aurora, Ind., relates (*Western Journ. Med. and Surg.*, Sept. 1868) a case of this in a strong healthy boy, eight years of age, whose clothes being caught in some machinery, he was thrown over with great violence. On examination, Dr. S. at once detected dislocation at the right hip-joint. The limb was shortened, toes inverted, and the head of the femur could be distinctly felt resting high on the dorsum of the ilium. Dr. S. at once attempted reduction by Reed's plan, but not succeeding immediately in getting the bone over the rim of the acetabulum, he placed a roll of cloth of the proper size in the groin, partly resting against the anterior portion of the ilium. "This was held firmly in its proper place, while the limb was gently flexed upon the abdomen over the support which acted as a fulcrum; this raised the head of the femur and prevented it from rolling from the desired position, and by gently moving the limb outwards, and at the same time raising the leg, when I had it in the desired position, I had the pleasure to hear the bone glide into the socket with the noise usually heard at the time when dislocations of the femur are reduced. All motion of the joint was now free and unattended with pain, and the boy declared that he was well. The usual after treatment was resorted to, and in five weeks he had entirely recovered and was walking without the least lameness."

Strangulated Hernia operated on without opening the Sac.—Dr. ERSKINE MASON relates (*The Medical Record*, Aug. 1, 1868) five cases of this for the purpose of showing the readiness, even in small, as well as in large hernia, with which the operation of not opening the sac can be performed, as well as its giving promise of far better success, than when the sac has been opened, the gut exposed to the air, and subjected to handling. "So seldom," he remarks, "do we find the stricture to be contained inside the sac, and so rarely does real necessity occur for the opening of its peritoneal covering, that I think we can

rarely be justified in choosing any other operation than the one advocated in this paper. It has been contended by some, that this operation might lead to the reduction of the gut, when in a gangrenous condition. This objection, it appears to me, might be used with equal justice against the employment of any means to effect reduction short of a cutting operation. Should the contents of the sac be such as to forbid their reduction, this could be determined both by the eye and by the sense of smell, in the majority of cases, without wounding the sac. If not, then it would be time enough to resort to the old method of operation.

"In one case we were tempted to resort to this practice from the dark appearance of the intestine, and portions of the sac, but warm applications by means of sponges wrung out in hot water proved sufficient, after the stricture was divided, to restore the parts to their normal appearance. The majority of deaths occurring after the operation for strangulated hernia, are due to peritonitis, and this certainly seems far more likely to follow after the sac, which is so often inflamed, is wounded, and the intestines and omentum subjected to digital manipulation, than where these are carefully protected from such exciting causes. Again, should any vessels, as the epigastric or obturator, become wounded, the risk of hemorrhage taking place into the peritoneal cavity is avoided; and the patient's chances for recovery thus increased. Looking at these facts, and, as we shall show from statistics, the very favourable results of this operation, it seems surprising that surgeons should ever think of practising any other, when the case would at all admit of it. This operation is the one I believe now advocated by English surgeons, but as yet not so much practised in this country."

The Climate of Aiken, S. C.—Dr. W. F. PERCIVAL has published (*Med. Record*, July 1, 1868) some observations on this. Aiken, he says, is "in Barnwell District, S. C., 120 miles from Charleston, and sixteen miles from Augusta, Geo. It is situated at the western end of an elevated table land, containing an area of about twenty square miles. Its elevation is 600 feet above tide water, and 400 feet above the Savannah River at Augusta. The soil is sandy, with a substratum of siliceous red clay. This soil is exceedingly porous, no water being found at a less distance than from 80 to 125 feet. The water obtained from this depth is clear, with a temperature about 60° Fahr., slightly impregnated with iron, not enough, however, to affect its sensible properties.

"The drainage of this table land is effected through creeks, located from four to six miles at the nearest point, and with a depression of from 150 to 300 feet below the level of Aiken. It is surrounded for many miles with a growth of long-leaf pine and dwarf oak. From its great elevation and distance from water-courses, it is exempted from all malarial diseases, endemics are unknown, and epidemics exceedingly rare; when they do occur the type is very mild. The mean temperature of the winter months is 44°; that of the summer months 77°; the annual mean about 52° Fahr.

"The prevailing winds are from the south and southwest.

"As the hygrometric condition of the atmosphere is of material importance, I regret that I can give no observations by means of instruments, and must rely on comparative means as illustrative of dryness of atmosphere. Steel instruments do not rust when exposed, mur. soda, nit. potas., sulph. mag., etc., absorb but little moisture, and do not sensibly change, even when exposed for months. Facility of access and the avoidance of a long and tedious journey, are of great importance in the case of invalids.

"Aiken is within forty-seven hours' travel by railroad of New York, the South Carolina Railroad passing through the centre of the town. There are daily mails and telegraphic communication with all parts of the Union; and the comforts and luxuries of the large cities are readily obtained. Tuberculosis being the result or symptom of lowered vitality, and a depressed state of nervous power, and from the fact that a warm, moist atmosphere conduces to the softening of tuberculous deposits, and the supplementary action of the skin, which is always greatest in dry, elevated localities, and always least in moist climates, it seems useless to dwell upon the necessity of an elevated, moderately cold and dry locality, for the climatic treatment of tuberculosis. I will here give a state-

ment of the meteorological condition of places to which invalids are usually sent:—

"St. Augustine, Florida: elevation about 20 feet, situated on the shores of St. Augustine Bay. Winter mean, 58°; summer mean, 80°.

"Pilatka, on the St. John's River: elevation, 25 feet. Winter mean, 57°; summer mean, 80°.

"Jacksonville, on the St. John's River. Winter mean, 58°; summer mean, 82°.

"St. Paul's, Minnesota. Winter mean, 19°; summer mean, 68°.

"A comparison of the meteorological status and accessibility of Aiken, with the warm, moist climate of Florida, and the dry, but exceedingly cold climate of Minnesota, will, I think, recommend it to the attention of the medical profession."

The above statement, *so far as it goes*, is very favourable, but there are other points ever more important to invalids than mere climate, in regard to which information is desirable.

The chief advantage of a mild climate for consumptives, is that it enables them to live much in the open air, and to take exercise in walking, riding, or driving. We could wish to be informed whether the walks and drives in the neighbourhood are good and diversified, and whether horses and carriages are readily to be procured.

Good lodgings are essential. Can invalids obtain such in private families where they can enjoy some of the comforts of home and cheerful society; or must they be crowded into a large hotel, where the incessant coughing of others at night prevents sleep, and the constant association with fellow sufferers has a tendency to depress the spirits and beget despondency, the worst influence to which the consumptive invalid can be subjected? If the consumptives cannot in addition to a mild climate obtain suitable food, opportunities for out-door exercise, and be exempted from the baneful influences just hinted at, they had much better remain at home. To obtain a single advantage they may subject themselves to many counterbalancing evils.

Carbolic Acid in the Treatment of Conjunctivitis.—Dr. E. L. HOLMES states (*Chicago Medical Examiner*) that he has been induced to try the carbolic acid in diseases of the conjunctiva, and he says that he has "found in about a dozen cases, at the infirmary, both of acute and, especially, of chronic inflammation, that the patients made a good recovery under its use.

"It is doubtful whether it possesses any advantage over the ordinary astringents, and yet it may be a desirable agent in cases where the usual applications fail. In two cases of purulent conjunctivitis, its use between the applications of nitrate of silver, after the latter had been tried two days, seemed to rapidly overcome the excessive discharge of pus. Possibly, its antiseptic properties may aid in destroying any specific poison that may exist.

"When applied, in a saturated solution, to the conjunctiva, as also to the mucous membrane of the mouth, it produces an intense burning pain, which almost invariably subsides in a few moments. It produces a thin, white pellicle on the surface where it is applied, which is soon cast off, leaving scarcely any irritation."

Pumpkin-seeds for Tapeworms.—The efficacy of pumpkin-seeds in removing tapeworms is not as generally recognized as it should be. Dr. D. B. HOFFMAN relates (*Pacific Medical and Surgical Journal*, Aug. 1868) a case in which an entire tapeworm, over six feet long, was discharged after the patient had taken a dose of pumpkin-seeds followed by castor oil with the oil of turpentine.

Liquid Oxysulphate of Iron.—Dr. J. R. BLACK extols (*Cincinnati Lancet and Observer*, March, 1868) the following preparation, the formula for which was handed to him five years ago, by an old physician of Tennessee. R.—Ferri sulph. ʒij; acid. nitric. fʒij; aq. destill. fʒiiss. Rub the sulphate with the acid; slowly in a mortar, gradually add the water after the sulphate is all dissolved, and filter through paper. Dose, from six to twelve drops in water or quassia infusion or syrup. Dr. B. says that this is the most palatable of all the ferruginous preparations."

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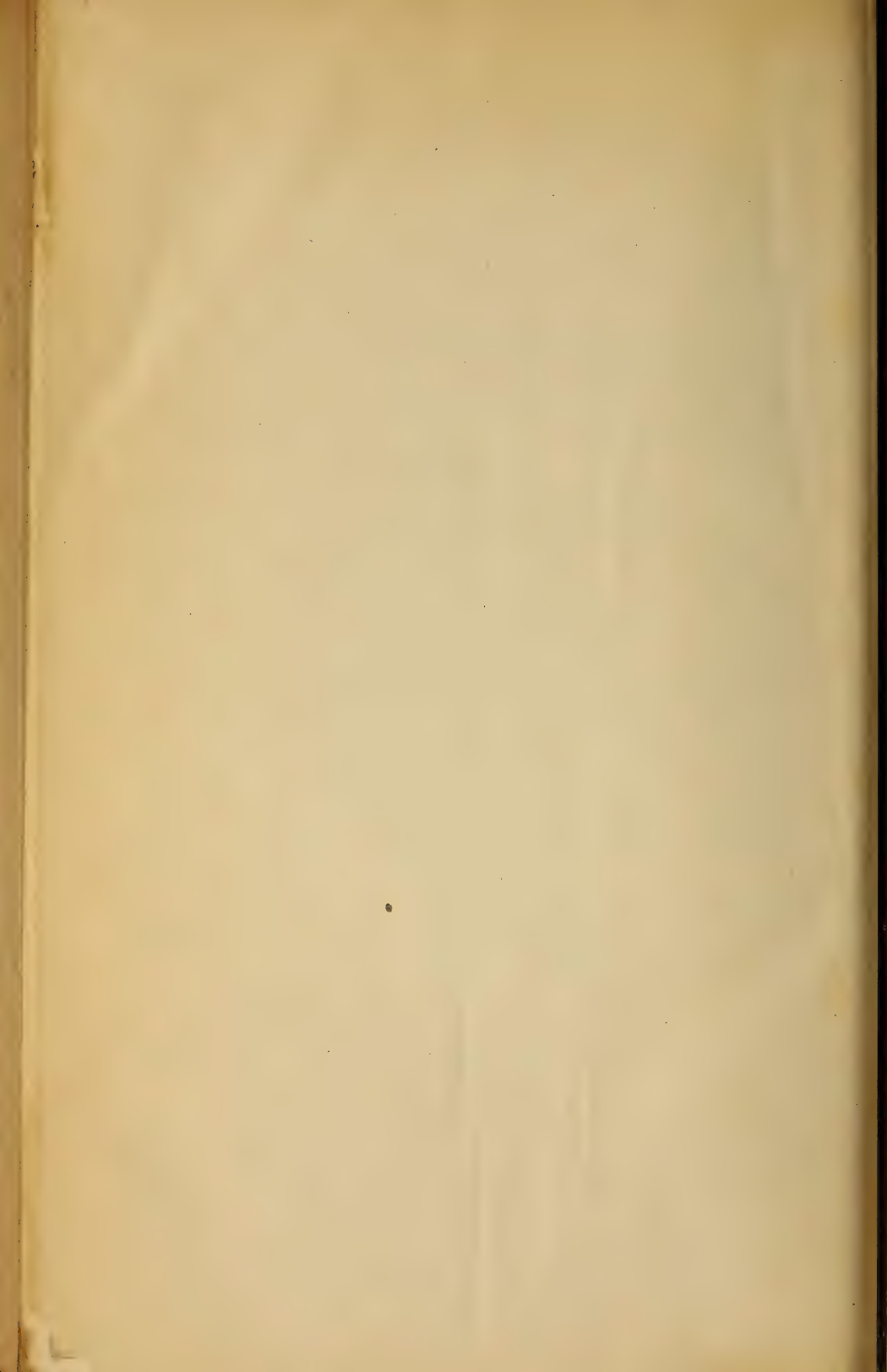
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